AUG 24 1944

TELEPHONE ENGINEER and Management

"THE NATIONAL TELEPHONE MAGAZINE"

AUGUST, 1944

featuring –

TEXT OF DIRECTION NO. 1 OF UTILITIES ORDER U-3

I. C. BURDEN LEAVES USITA

FLY RUMORED RESIGNING FEDERAL COMMUNICATIONS COMMISSION

•

EDITORIAL INDEX—Page 8

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THE COVER PICTURE

Close-up of a blown-out railroad bridge in France. The retreating Germans flooded the area and destroyed all bridges. Members of a Signal Corps unit replace shattered telephone lines along the right of way. June 19, 1944.

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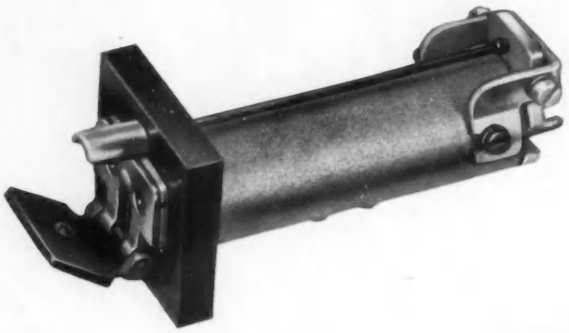
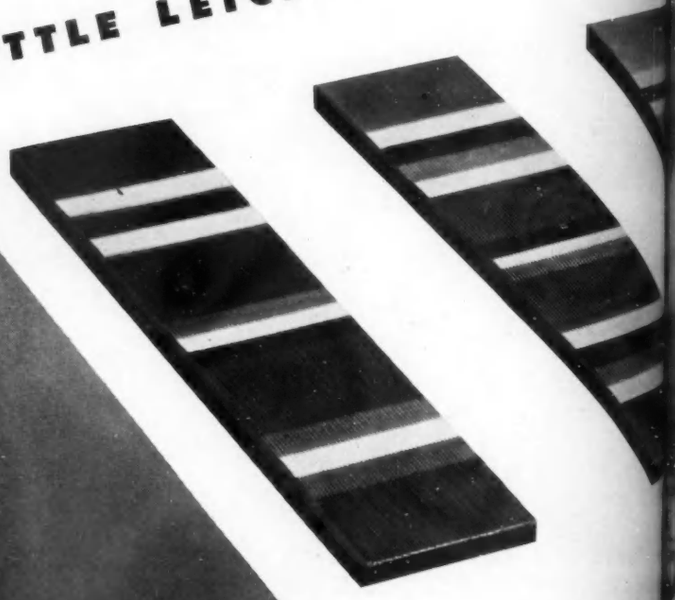


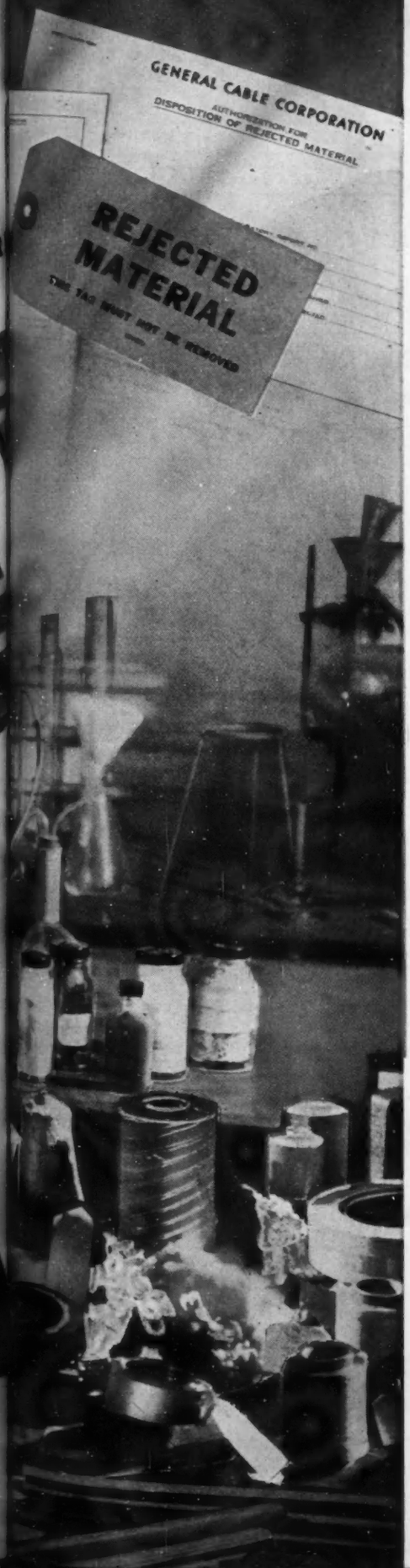
THIS LITTLE LEICH SWITCHBOA



An almost unbelievable number of these little Leich signaling units are now in active war service all over the world. When you see those black lines on war maps indicating where American boys are fighting, you can be reasonably sure that Leich drops (or similar units made by other telephone manufacturers) are mighty close up. When the going is tough; when operating conditions are "indescribable"; these dependable, positive-acting little signals are proving their worth.

Credit for the faithful war service of these drops belongs emtirely to the progressive telephone operating man—of today and yesterday. It was his guidance and counsel that inspired their design. It was his sympathetic support of telephone manufacturing organizations that built the facilities to make them. It was his constant insistance on quality that, in the end, indirectly became one of his greatest contributions to the war effort.

CABLE'S OWN "BUREAU OF STANDARDS"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Assurance of standardized quality in the electrical wire and cable products supplied by General Cable starts with our firm control of raw materials. To insure absolute uniformity at all 9 manufacturing plants, each material used is accepted or rejected by the "Control Testing Laboratories" situated in each plant, to specifications established by the General Research Laboratory at Bayonne. The time of an entire Bureau of the General Research Laboratory is devoted to the setting of these standards and the devising and supervising of uniform tests to enforce them. Under such a program one does not have to hope for or demand quality control — one gets it.

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Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose

A new Direction has been released by the Communications Branch of the War Production Board as of July 31. It is called Direction No. 1 on Order U-3 and applies to the telephone industry. As usual we are giving you the details and the complete text of the Order. It starts on page 42. If you do not have the order on file we suggest you file this copy.

▲

On August 1 it was our unhappy duty to wish our former Editorial Assistant Mrs. Dorothy Holmes goodby and Godspeed. She will accompany her husband, a chemical engineer, to California where they will make their home. Dorothy has become well known in our industry and in her few years with us has made a wonderful record of accomplishment. We will miss her.

▲

Chief Signal Officer Maj. Gen. H. C. Ingles is to be congratulated on the recognition his department has made to our industry. The "Certificate of Appreciation" which has been received by a few individuals and a number of the State Associations is an honor that means much to the recipients. It is the duty and the habit of the telephone industry to do their job quietly and unostentatiously — to be recognized is unusual. On behalf of the industry we thank you General Ingles!—R.W.S.

TELEPHONE ENGINEER AND MANAGEMENT

VOL. 48, No. 8 AUGUST, 1944

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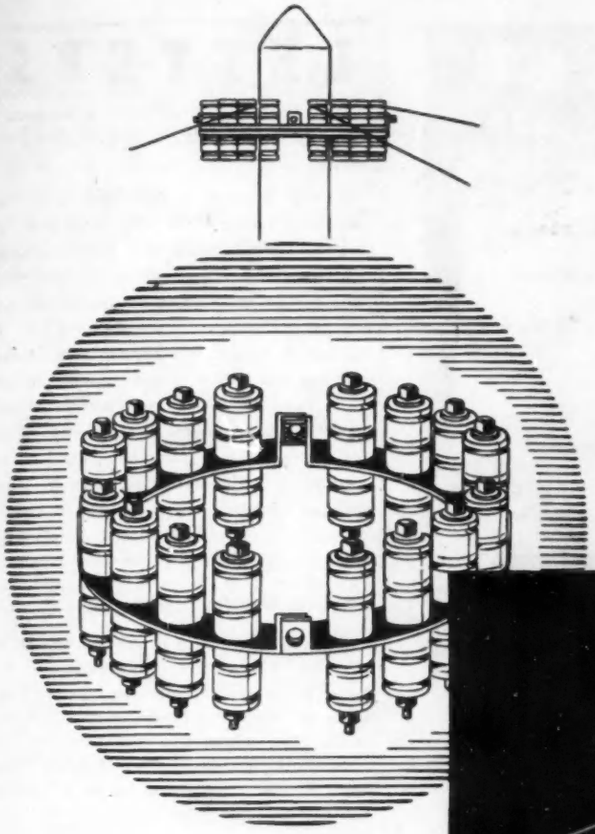

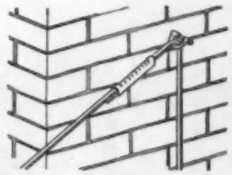

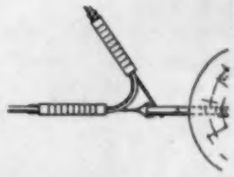

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Utilities Order U-2, the regulation that limits the installation of public telephones, specifically provides for "essential public paystations", and the use of wiring materials required in connection with their installation. For such installations, telephone companies are permitted to use the AA-1 preference rating granted by Utilities Order U-3 for maintenance, repair and operating supplies.

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LETTERS

from TELEPHONE ENGINEER readers

In this column of our June issue we carried a letter from Mr. Ackerman of Cygnet, Ohio, stating that static voltages which sometimes accumulate on open wire lines can be discharged by simply connecting 1.0 m.f. condensers from each side of the line to ground. We should have pointed out that this is not a good method to use as it imposes a severe transmission and signalling impairment. We recommend the use of center tap grounded retard or repeating coils for relieving lines of static charges.—Editor.

◆

Dear Mr. Smith:

I would like to add a word of caution to Mr. Sy Acherman's suggestion, in his letter to the Editor, published in the June issue of Telephone Engineer and Management. This suggestion was that two one microfarad condensers, connected from each side of a telephone circuit to ground, be used as a drainage coil, or to eliminate "static".

This would amount to a one-half mf condenser connected across the line, and at 1000 cycles the usual frequency representative of voice currents would amount to an impedance of only 318 ohms. Such an impedance bridged across the usual open wire line would cause a transmission loss, at 1000 cycles, of about 5 decibels. While, if the particular line was fairly short and was never connected to any other long line, such as in long distance service, the 5 db might be of no great consequence. But in transmission maintenance we would usually go to considerable trouble to eliminate a loss of 5 db. It is true that the 5 db loss in itself may cut down the loss, due to increased attenuation, but this is sort of like "cutting off your finger to ge trid of a wart".

Furthermore, the usual stock condensers may vary from one another as much as 5%, so, unless two specially matched 1 mf condensers were used, would be inclined to think a 5% difference between them might aggravate the noise more than it would cure it.

A well constructed drainage coil, or line winding of a phantom repeating coil, will add a bridged transmission loss of only 0.1 db or so, and with its center point grounded, should think this would be the far preferable thing to use.

Yours very truly,
W. Chunn
Telephone Engineer
Missouri Pacific Railroad
St. Louis, Missouri

Gentlemen:

I have been receiving your magazine for quite some time now and will say I like it very much.

I think your articles on rural maintenance and problems are very good for us because we have a lot of rural subscribers and most of them are on grounded lines.

I think our biggest problem is with the rural subscribers.

All in all I appreciate your magazine very much and would not think of being without it.

Yours very truly,
Herbert J. Lien, Manager
Blackduck Telephone Co.
Blackduck, Minn.

◆

Dear Mr. Smith:

I have a suggestion that might have some merit, in the line of a postwar product, a substitute for a small lead cable. This cable would have several advantages, should be low in cost, easily installed and maintained. The idea is to start with an iron or steel wire having weather-proof insulation, to be used as a core, around this core to be wound a single layer of enamel double cotton covered magnet wire that has first been twisted in pairs and weather proofed with some suitable liquid insulation. If the pairs are properly wound around the core, by a slight gap between convolutions, it would be an easy matter to locate any pair for testing or tapping. There are, of course, other ways of locating pairs. There are many places where a cable of this kind could be used to advantage. The manufacturing could probably best be done by those now engaged in somewhat similar work.

Geo. A. Bishton
Box 645
Cedar Rapids, Iowa

◆

Dear Mr. Smith:

I have enjoyed the Telephone Engineer very much. It is interesting and refreshing especially to the "old timer" who had to render service and make the blame thing work one way or another.

We grew up under the Pioneers. Restoration of service at the earliest practicable moment was paramount. One of the most interesting things that happens to me is when I can get with some old timers and listen to the way they got the job done. We can all tell some wonderful experiences we have had in restoring service that the public has never dreamed about. Even though we are forgotten we can feel that we contributed considerably to the advancement of this great industry. The writer of specification was not doing so well in those days. He had just begun to get his pencil sharpened. He profited by our experience. We blazed the trail. He but came along and paved the way for others.

(Please turn to page 52)

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However, as the majority of our production is still for the United States Armed Forces, and our civilian schedule is limited we advise early action — Write, Wire or Phone (GA 3160) for details.

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PUBLIC UTILITIES EQUIPMENT FOR MOTOR VEHICLES

Speedier construction
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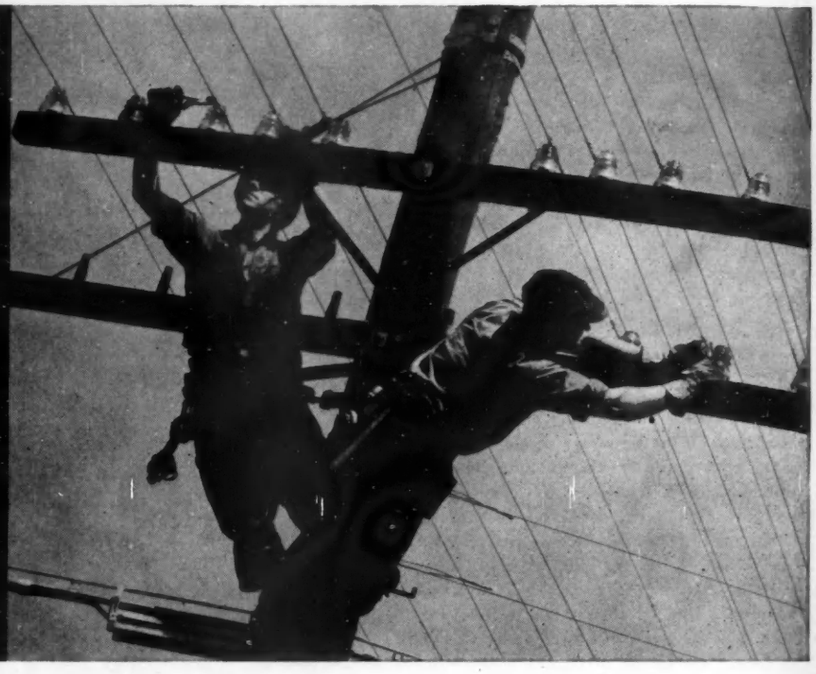

LONGER SPANS—made possible by the extra strength of AMERTEL-85 and AMERTEL-135 High Tensile Wires—help reduce construction time and costs. Fewer poles are needed—less hauling, less digging, less connecting. Valuable manhours and materials are saved.

The extra strength of these wires also saves on maintenance. They withstand the strain of wind and ice loads. With continuity of service so vital to the war effort—and with maintenance crews cut to the minimum—this extra protection against failures is highly important.

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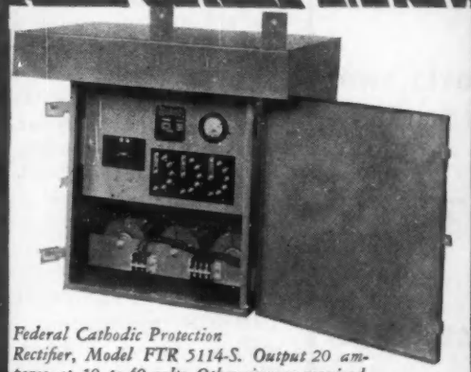

Federal Cathodic Protection Rectifier, Model FTR 5114-S. Output 20 amperes at 10 to 40 volts. Other sizes as required.

"Leap-Frog" Corrosion damages underground pipes and cables.

Pipes or other metal structures are in places electro-positive in relation to the soil and due to natural galvanic action corrosion results. Metal is taken away from one section of pipe and deposited somewhere else along the exposed pipe.

By using Federal Cathodic Protection Rectifiers, "Leap-Frog" corrosion is foiled. On constant guard is a direct current charge which cancels the harmful electrolytic corrosive action on oil, gas and water pipelines and underground cables.

These Federal units have no moving parts, so they last indefinitely — with the absolute minimum of attention. In desert heat or torrid dampness they keep on the job day and night.

Proper engineering for the corrosion problem at hand calls for the specialized consulting engineering service which is yours — when you look to Federal. Write today for full details.

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25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of August, 1919.

Telephone men hailed Congress' return of the control of telephone and telegraph systems to their owners, supervision of all telephone properties having been under the Postmaster General during the World War I emergency. It was pointed out to the telephone men that the recovery of their temporarily curtailed power, while welcome, was not an unmixed blessing, or, as August, 1919 TELEPHONE ENGINEER puts it, "wholly conducive to repose." Rate problems and the possibility of strikes were among the considerations uppermost in the mind of the telephone industry.

★

Telephone materials and electrical goods left from unfinished war contracts were on display in a Chicago warehouse, to be sold to the highest bidder, according to August, 1919 TELEPHONE ENGINEER.

★

A Kansas court ruled that a midwest telephone company was in the wrong in a suit brought by an irate housemover, who found himself balked by overhead telephone wires when he attempted to pass with a house he was moving. The telephone company said it would move the wires if the mover would pay the $15 cost—the mover would not, and the house was left standing in the street for several days, says August, 1919 TELEPHONE ENGINEER. The houseowner finally had his fill of the delay, paid the $15, and deducted it from the mover's bill—thus the suit against the company.

★

August, 1919 TELEPHONE ENGINEER reports that returning soldiers, former linemen for the Chicago Tel. Co., were welcomed home by officials of the company at a luncheon at a Chicago hotel, and invited to return to their jobs if they wished. The veterans remarked that the Europeans with whom they had come into contact were greatly astonished by American methods of telephone construction.

A NEW BUILDING DEVOTED TO ASSEMBLING SWITCHBOARDS

Stromberg-Carlson's greatly expanded production of switchboards for the Armed Forces soon caused the quarters occupied by Switchboard Assembly prior to the war to be outgrown.

Consequently, Stromberg-Carlson erected a new building, containing 11,000 sq. ft. of floor space, devoted exclusively to assembling switchboards and switchboard equipment.

In addition to providing more space to house an enlarged staff, this building contains every facility required for the faster, more efficient, and more economical assembling of switchboards for the war effort.

After Victory, this building will be available for the assembling of civilian switchboards—RELAYDIAL, Super-Service, Junior Multiple, P. B. X., Magneto, and all others for which Stromberg-Carlson is famous.

This new building is just one of the many steps Stromberg-Carlson has taken to insure Progress in Telephony. After the war, this progress will make Stromberg-Carlson civilian telephone equipment even more worthy to bear the company's slogan, *"There is Nothing Finer than a Stromberg-Carlson".*

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ARMY E NAVY

STROMBERG CARLSON

PROGRESS IN TELEPHONY

EDITORIAL

The Last Big Push

WE seem to have good reason to believe that the war in Europe will end fairly soon.

At this writing the Allied forces in France have broken out of the Cherbourg peninsula, have over-run the Breton peninsula, and are heading for Paris. The Russians are hammering at the gates of East Prussia and are advancing through Poland upon the German mainland. In Italy the Allies are slowly but surely ridding the land of the German invader.

Turkey has declared herself and may soon be in the fighting on our side. Bulgaria, the bellwether of the German defeat in 1918, may soon be forced out of the war. With her gone, Germany will lose the Balkans. Finland is trying to make peace with Russia.

It all looks good, but—

The valor and determination of American and allied troops, great as it is, cannot win this war alone. Our far-flung fighting fronts must continue to have an undiminished, and in some cases even an augmented, flow of American production. The need for this is more urgent now, in order to keep our own and allied armies adequately equipped for the last big pushes, than it was before the situation of the enemy became so critical.

Even partial failure of the supply lines now will prolong the German war for months and cost unnecessarily the lives of many thousands of Americans and Allies.

So if any of us in the telephone industry have a tendency to wonder why, now that the war with Germany seems to be nearing its end, we cannot have more materials and equipment, the answer is simple: American manpower, materials and production for war are more vital now to the achievement of a quick victory over Hitler and his gang than they have been at any time during the war with Germany.

The things we want and cannot now obtain will be available to us all the sooner if we do without them now.

Meanwhile we must not only supply our military forces with everything we know they will need; we must, to be safe, be in position to supply them with things they may never need. It is better, for instance, that the army have thousands of field telephone sets it may never need than that a lack of field sets prolong the war a single day.

We here at home have our part to do in the last big push against Germany. Our job is to keep the supply lines going full tilt. Everything that any one of us does that contributes to that job helps to shorten the war.

Michigan Public Service Commissioner Florence Kiely and Senator Arthur Nelson smile for the TELEPHONE ENGINEER camera.

Charles W. Cheeney, Chesaning, Michigan Independent Telephone Association president-elect and Harold A. Daschner, Lansing, one of the principal speakers at the Michigan meeting, pose together.

The Michigan Convention Report

By RAY W. SMITH, Editor

THE Michigan Independent Telephone Association held a one day annual convention this year at Lansing on July 12 and was rewarded with the heaviest attendance in its history. A well diversified program was presented, with emphasis on the problems of the smaller companies.

Charles W. Cheeney, Chesaning, was named president; E. R. Vaughan, South Haven, vice president, and Jane McNally, Lansing, secretary-treasurer.

Nelson T. Wing, Grass Lake; W. F. Bradstreet, Rollin; R. C. Smith, Homer; Mr. Vaughan; H. R. Christianson, Muskegon; L. W. Reynolds, Ontonagon; Ernest Sprague, Lake City, and R. B. Sage were elected directors for the next year.

The association is in sound financial condition, according to the annual report given by Mrs. McNally, and later approved by the association's auditing committee.

B. C. SCHWEITZER, Owosso, retiring president, reported in the president's annual address that the association had enlarged its membership during the association year. As the new 40c minimum wage rate was effective the week following Mr. Schweitzer's report, the retiring Michigan chieftain devoted most of his remarks to this subject. Other orders issued by several of the government war agencies were also discussed. In regard to Michigan operating companies themselves, Mr. Schweitzer reviewed the decisions of the Michigan Public Service Commission, particularly the State Supreme Court's decision in the Detroit-Edison case. He urged Michigan Independents to check their rate structures.

During his address Mr. Schweitzer spoke highly of the trade papers and their assistance to the industry.

A representative of the Social Security Board from the Cleveland, Ohio, Regional Office was then presented by Mr. Schweitzer, and discussed "Some Aspects of Social Insurance." The speaker, Thomas Hughes, called attention to the proposed changes that might be handled by governmental agencies in later years to enable a much enlarged program under the term "social security."

"The Assessment of Telephone Companies and Other Utilities in Michigan" was the subject of Allen L. Weston of the Michigan State Board of Assessors. He outlined the plans and work that have been formulated to consolidate the tax bureaus in Michigan to eliminate unnecessary forms as a time-saver.

Talking things over between sessions at the Michigan Independent Telephone Association (l. to r.): Clyde S. Bailey; Burton Saunders (back to camera); Terry King; E. M. Blakeslee; and H. M. Stewart.

Comparison and Analysis from 1943 Reports Michigan Independent Telephone Companies

	Class A 3 Companies 143 Exchanges	Average per Exchange	Class B 1 Company 2 Exchanges	Average per Exchange	Class D 70 Companies 93 Exchanges	Average per Exchange
Capital Investment per Books	$14,574,783	$101,921	$154,178	$77,089	$1,038,727	$11,169
Gross Revenues	3,834,557	26,815	51,891	25,945	510,137	5,485
Operating Expense Including Depreciation	2,116,606		48,622		390,269	
Taxes	1,011,623		3,626		43,755	
Total Operating Expense and Taxes	3,128,229	21,875	52,248	26,124	434,024	4,666
Available for Interest and Return	706,328	4,939	357	179	76,113	818
Company-owned Stations	82,894	579	1,186	593	16,419	176
Gross Revenue per Hour of Service	437	3.06	5.92	2.96	58.23	0.62
Net Revenue per Hour of Service	80	0.56			8.68	0.09
Gross Revenue per Station per Year		46		43.75		31.16
Net Return on Capital Investment per Books	4.77%				7.32%	
Per Station Value per Books	175		130		63	

Fig. 1

Harry Ward, engineer of the Michigan Highway Department, was present during the program, and when called upon, he explained the postwar program of the highway department, offering the cooperation of the department in moving telephone pole lines to accommodate new road building projects.

STARTING the afternoon session was Harold A. Daschner, Lansing, manager of the Michigan Retail Hardware Association, who gave those in attendance a glimpse into the crystal ball of future plastic developments. Illustrating his various prognostications, Mr. Daschner had on hand a large display of so-called substitute materials that have, in many cases, proven of more worth than the products they supplanted. Mr. Daschner is a rapid-fire speaker, and held the attention of his audience during his entire address.

Senator Arthur E. Nelson, St. Paul, Minnesota, a prominent telephone attorney and author of "The Independent Telephone Company in the Middle of the Squeeze", which was reproduced in our May issue, was the principal speaker of the day. He surveyed the state of Michigan prior to the convention, and used charts to show the condition of the aggregate Michigan Independents. We are reproducing both of these charts in this report. In illustrating his point, Mr. Nelson in one of the charts depicted the wide range of rates, showing the highest and lowest now in effect among Independent companies in Michigan.

Terry King of Lansing laughs with George F. Sharland and Nelson Wing at the Michigan convention.

In part, Mr. Nelson said:

"It is doubtful if at the present time, the small Michigan Independents are paying more than an average of 32c per hour to operators in exchanges having more than 500 stations, while at exchanges with less than 500 stations, the average pay for operators does not exceed 20c per hour.

"You are familiar with the fact that on June 21, 1944 the Wage & Hour Division of the United States Department of Labor issued an order directing a minimum pay rate of 40c per hour to all operators employed in exchanges with more than 500 stations. Increases necessary to bring the wages up to the minimum of 40c per hour at such exchanges will mean perhaps 10c an hour added operator costs.

"While not subject to the Wage & Hour Act, the exchanges with less than 500 stations are even more vulnerable from the competitie point of view in Michigan, and it is likely that increases of 10c in the larger exchanges will necessitate at least equal or perhaps greater increases at the smaller exchanges in order to hold operators on the job.

"For the United States as a whole the ratio of operators per station is a relatively fixed quantity and applying the same ratio in Michigan, it is found that about 615 operators would be required for the Class A Independent companies, and about 125 for the Class D companies. Assuming only

10c per hour incease for 2,000 hours a year, the cost to Class A companies would be $123,000, or approximately 18% of their 1943 operating income. Increased differentials will add considerably to this additional operating cost.

"In the case of Class D companies, 10c per hour for 2,000 hours a year would amount to $25,000, which would wipe out approximately one-third of the amount available for interest and return.

"Actually these estimates are far too conservative, since it is clear that in the smaller exchanges at least, the average operator must work more than 2,000 hours per year. For example: assuming a 24-hour coverage of a given board, and only one operator, even for the peak loads, and no relief or vacation operators, each exchange would require a minimum of 8,760 operator hours of paid time per year, and at 10 cents an hour, the average increase would be $876.00 per year per exchange. Applied to the 93 Class D exchanges in Michigan, the total increase in cost would be $81,478.00, and would completely wipe out the total operating revenues of these exchanges."

Clyde S. Bailey, executive vice president of the United States Independent Telephone Association, Washington, D. C., was the principal speaker at the annual dinner of the Michigan Independents held during the evening. His address gave Michigan Independents a much clearer insight into the affairs of the national association.

A group of experts answered questions on traffic problems during the Traffic Clinic which was a part of the traffic session at the Michigan convention.

THE traffic conferences of the Michigan Association was held simultaneously with the general session. Miss Lydia Mielke, traffic superintendent of the Tri-County Telephone Co., South Haven, Mich., presided as chairman of the session. On the committee with Miss Mielke were: Miss Mona B. Lamb, chief operator from Muskegon; Miss Carrie Anderson, traffic superintendent of Owosso's Union Telephone Co.; and Herbert F. Emery, traffic superintendent of the Michigan Associated Tel. Co.

Possibly the most interesting paper at this conference was that delivered by Robert P. Singlehurst, assistant general manager of the Union Telephone Co., Owosso. When war was declared on December 7, 1941, Mr. Singlehurst was with the Mutual Telephone Co. of Hawaii, and he outlined for the traffic conference all details of this telephone company"s activities during and following the Pearl Harbor attack. As the Mutual Telephone Co. operates over 55,000 telephones, of which approximately 45,000 are dial, the outstanding job done by that company was of world-wide importance.

Others assisting at the traffic session were: Harold L. Packer of Michigan Bell Tel. Co.; Miss Nina Harris; Alma; Miss Katherine Watson, Adrian; Miss Nellie Couch, South Haven; Mrs. Alice Wallace, Coldwater; and Miss Doris Hicks, Mount Pleasant.

Telephone Company Changes Hands

Milo F. Stok, Belle Plaine, Iowa, has purchased the Citizen's Co-operative Telephone Company and assumed charge July 1. Mr. Stok named the company the Citizen's Telephone Company.

The telephone company was organized in 1905, and W. C. Harris, manager, has been connected with the organization ever since and has given the patrons and directors of the company excellent service.

Maximum and Minimum Per Station Rates of Independent Telephone Companies in Michigan

		Business			Residence			
Stations		Individual Line	2 Party Line	Rural	Individual	2 Party Line	4 Party Line	Rural
250 or less	Top	$3.50	$3.00	$3.25	$2.50	$2.00	$2.00	$2.75
	Bottom	.50	.65	.46	.50	1.00	1.00	.46
251 to 500	Top	3.75	3.00	3.00	2.75	2.25	2.00	2.50
	Bottom	1.33-1/3	1.25	1.16-2/3	1.25	1.00	1.00	1.16-2/3
501 to 750	Top	4.00	3.00	3.50	2.84	2.57	2.29	2.75
	Bottom	2.25	1.75	1.75	1.50	1.50	1.25	1.50
751 to 1000	Top	4.00	3.00	2.75	2.75	2.00	2.25	2.00
	Bottom	2.25	1.92	1.50	1.50	1.50	1.25	1.50
1001 to 2000	Top	4.75	4.00	3.25	3.00	2.50	2.25	2.75
	Bottom	2.75	3.50	1.75	2.25	2.50	1.75	1.75
2001 to 4000	Top	5.25	4.25	3.25	3.10	2.50	2.25	2.75
	Bottom	4.25	3.35	2.08	2.50	2.15	1.90	1.75

Fig. 2

Telephone Engineer's TRAINING COURSE

☆

ELECTRICAL FUNDAMENTALS FOR THE TELEPHONE MAN

☆

Part XIV---Use of Bridge in the Location of Grounds, Shorts, Crosses, and Opens in Open Wire or Cable

General

AS has previously been mentioned, the Wheatstone Bridge is peculiarly adapted to the measurement of faults of all types in open wire or cable circuits. Its outstanding advantage as a fault measuring instrument is the fact that the accuracy of measurements made are more or less independent of the resistance of the fault itself, whereas with ordinary ohmmeters the resistance of the fault appears in series with the circuit under measurement, thereby resulting in inaccurate results.

There are two outstanding methods whereby a Wheatstone Bridge can be used to measure all types of open wire and cable faults and these are known respectively as the (1) **Varley Method,** and (2) the **Murray Method.**

Basically, they depend on the same principles but arrive at the desired result in a different manner. Because the Varley method is the most practical, it only is fully treated in the following paragraphs.

Basic Principle of the Varley Method

THERE are two Varley Method measurements, one of which is known as the **Simple Varley Method** and the other the **Three Varley Method.** The Three Varley Method has sufficient advantages over the Simple Varley Method to warrant its use at all times in preference to the Simple Varley Method.

The Simple Varley Method, however, lends itself to explaining the theory of the Bridge as a fault locating instrument, hence this method is fully described in the following paragraphs.

It is of vital importance to those wishing to master Bridge technique that the electrical principle whereby faults can be located by the Bridge Method be fully appreciated and understood. The diagrams and explanations which follow were prepared to show exactly what takes place when a Bridge is used to locate cable and open wire faults. Experience has shown that until these basic principles are understood, an individual will not have the necessary confidence in Bridge measurements to insure successful results.

The Simple Varley Method

TO illustrate the basic action of the Varley Method of fault location, we will assume that we have a ground on one wire of a cable pair. In order to locate this ground by the Bridge Method, we will require another wire which is free of faults and which has approximately the same resistance as the grounded wire. The other wire of the pair would be the ideal wire to use if it is free of trouble. The wire which is free from trouble is referred to as the **good wire** and the wire in trouble as the **bad wire.**

The good wire must be connected to the **X_1 post** of the Bridge and the bad wire to the **X_2 post.** At the distant end of the cable, the good and bad wires must be connected together and this connection is referred to as the **strap.**

The exact location of the strap is not important just so it is beyond the point at which the fault occurs, and likewise the Bridge may be placed at any point along the line just so the fault is between the strap and the Bridge. At the Bridge, we must disconnect the battery feeding into the junction of the R and X arms, and connect it to ground. (Note—This is usually accomplished by throwing a key on the Bridge.)

Figure 39 illustrates schematically the connections for the Simple Varley Method.

It will be noted that the A and B arms are set for a ratio of 1.0. In mak-

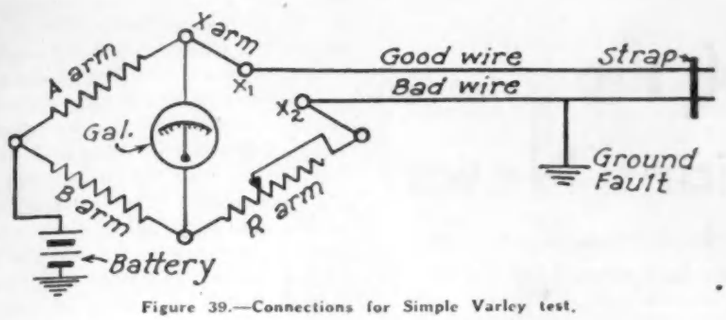


Figure 39.—Connections for Simple Varley test.

ing a Simple Varley Test, it is imperative that the ratio arms always be set on 1.0.

Now keeping in mind the basic arrangement of the four arms of any Wheatstone Bridge, let us examine the schematic of Figure 39 carefully. We will observe that the A and B arms are connected in the usual relationship but that the X and R arms are changed somewhat. It will be seen that battery current, instead of feeding into the junction of the R and X arm at the Bridge, now feeds into these arms through the fault and via sections of the good and bad wires.

The X arm instead of being merely a lumped resistance at the **Bridge** terminals, as would be the case in measuring the resistance of a ringer coil, now consists of all the resistance of the good wire plus the resistance of the bad wire from strap back to the fault. The R arm consists of whatever resistance may be inserted by the rheostat plus the resistance of bad wire from fault to Bridge. Reference to Figure 40 will prove that we still have our basic Wheatstone Bridge circuit.

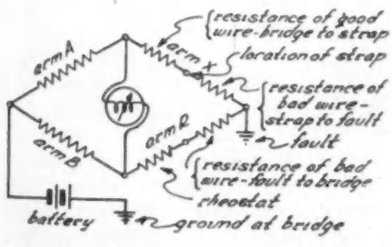


Fig. 40.—Schematic of Simple Varley Test.

It should particularly be noted that in using the Varley Loop Method, the fault itself is in series with the battery feed circuit, hence is common to all four arms of the Bridge. Being common to all arms of the Bridge, the resistance of the fault will not affect the accuracy of the measurements made. It is this fact that makes the Bridge more useful than other types of instruments for cable fault location work.

Effect of High Resistance Faults on Accuracy

WHILE we have stated that the fault resistance does not affect the accuracy of a Bridge location, it should be appreciated that, if the fault has exceptionally high resistance (above 100,000 ohms), the Bridge will be hard to balance and the measurements are likely to be in error. The error results from the fact that sufficient current cannot get through the high resistance fault to properly operate the Bridge galvanometer; however, under ideal circumstances, faults having resistances as high as 500,000 ohms can be located with fair accuracy.

The battery voltage can, of course, be increased when high resistance faults are encountered and this will force more current through the Bridge. However, the possibility of error in measurement is much greater on high resistance faults due largely to the fault resistance approaching that of normal shunt leakage paths that may be present on a cable pair, as for example—leakage across face plates in outdoor terminals, etc.

Typical Example of Simple Varley Method

NOW let us get back to our actual measurement of a ground fault on a cable pair using the **Simple Varley Method.** Let us assume that we have a ground on one wire of a 24 gauge cable pair and we are using the other wire of the pair as the good wire. The good and bad wires are connected together by means of a strap placed at the end of the cable. The bad wire is connected to Bridge terminal X_2 and the good wire to terminal X_1. The procedure is then as follows:

Step No. 1—With ratio arms set on 1.0, adjust R arm until zero deflection results when battery and galvanometer keys are closed. Call the reading obtained R. Assume that the Bridge balances with 90 ohms in the A arm.

Step No. 2—Compute resistance from strap back to fault. This is found by dividing R by 2, i. e., $X = \frac{R}{2}$ or $X = \frac{90}{2}$ = 45 ohms. (Resistance of bad wire strap to fault.)

Step No. 3—Compute distance (d) strap to fault. (Note No. 24 gauge cable—38.96 feet per ohm at 68°) d = X x 38.96 = 45 x 38.96 = 1753.2 feet strap to fault.)

If the basic principles of the Bridge are understood, it should be easy for anyone to understand how the Bridge can be used to locate faults, even though the fault itself may have considerable resistance.

Illustration of Simple Varley Computations

TO assist in this understanding, the above example is illustrated in Figure 41, in which the actual resistance of good and bad wires, and R arm setting are shown on the schematic diagram to illustrate just how the Varley Method functions.

It will be noted that it is necessary to cut into the R arm just double the resistance which exists in the bad wire from strap to fault, inasmuch as the X arm of the Bridge has all of the resistance of the good wire, plus a portion of the resistance of the bad wire, whereas the R arm has only the resistance of bad wire from fault to Bridge. Therefore, in computing the resistance of the bad wire from strap to fault

(Please turn to page 60)

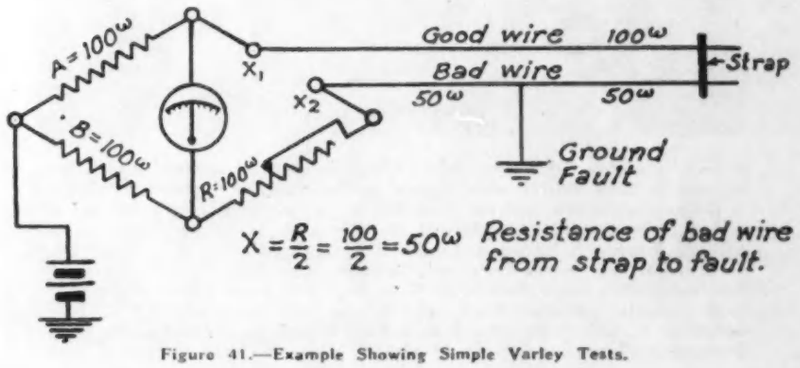


Figure 41.—Example Showing Simple Varley Tests.

Highlights of the Communications News

Important Communications developments of the past month, briefed for busy readers

by

ROLAND C. DAVIES
Editor, Telecommunications Reports

Postwar

POSTWAR planning in the fields of radio frequency allocations and in the orderly disposal of the Army-Navy surpluses of apparatus and equipment constitute two major activities in Washington that got under way at enhanced tempo during early August and promised to continue as uppermost subjects of study for the remainder of that month and during the early fall. Both spheres of planning are of considerable importance to the telephone industry.

In the postwar radio frequency allocations, the State Department through a special technical committee, made up of experts from the Army, Navy, Bureau of Standards, Civil Aeronautics Administration, FCC and State, launched this survey by conferences August 11 and 12 in Washington at which approximately 400 leading engineers and representatives of all branches of the communications industry, operating and manufacturing, and of the broadcasting industry, together with technical executives of the aviaion, railroad, police and other services using communications, attended. The Radio Technical Planning Board membership formed the key representatives from industry at the conferences.

Radio

REPRESENTING the telephone industry were such experts from the Bell System as F. M. Ryan, radio engineer of the American Telephone and Telegraph Co., and Dr. Ralph Bown of the Bell Telephone Laboratories; and from the Independent telephone industry Dr. R. H. Manson, vice president and general manager of Stromberg-Carlson Co. and Clyde S. Bailey, USITA executive vice president, and B. C. Burden, USITA Engineer. The Independent telephone industry has quite a potential stake in radio as a postwar development. It is visualized that radio microwaves and very high frequencies can be utilizzed for short-distance toll service in rural areas where wire construction is too expensive and for local telephone service to farms and ranches where distances between the central offices and main cables would mean a substantial outlay for the subscriber. Undoubtedly there may be some useful surplus Army Signal Corps radio-telephone equipment after the war which might fit into this rural telephony expansion.

The State Department conferences with industry were to analyze and study the proposed radio spectrum allocation which had been formulated by the Federal Government's own radio allocation body, the Interdepartment Radio Advisory Committee which decides on the radio space needed by the armed services and other government agencies. The determinations of the August 11-12 conference were to decide and map out the American government's policies on radio allocations and international cable and radio-communications for the postwar International Telecommunications Conference, certain to be one of the first parleys to be held after peace comes. In addition, the United States and Great Britain are expected to engage in conversations at a joint conference, probably this fall, on their mutual international communications problems and early in 1945 the Third Inter-American Telecommunications Conference, covering the communications planning of the Western Hemisphere after the war is to be held at Rio de Janeiro.

Politics

MEANWHILE, because of 1944 being a national political campaign year, consideration of the proposed merger of the American international communications companies by the Senate Interstate Commerce Subcommittee, headed by Senator Wheeler, is standing still and is likely to remain virtually shelved until after the November election. The State Department's special

Board of Directors, Ohio Independent Telephone Association meeting at Columbus Athletic Club, July 11, 1944, to receive Certificates of Appreciation awarded to the association and to Frank L. McKinney, its veteran secretary-treasurer are (l. to r.): Dr. C. L. Jones, Athens; L. R. Wittemore, Mansfield; Henry George, Ashland; Herman E. Hageman, Lorain; J. T. Carliss, Marion; Col. Merrill Beck, signal officer, 5th Service Command, Columbus, who made the formal presentation representing Major General H. C. Ingles, Chief Signal Officer of the U. S.; Ralph F. Mateer, Warren; Frank L. McKinney, Columbus; Colonel E. C. Evans, Columbus; Lt. Col. Gustav Hirsch, Columbus; Allen S. Crane, Portsmouth; Russell Goebricher, Conneaut; Col. David McKell, Chillicothe; and Rolland S. Jones, Athens.

A REQUEST

We have been asked by our government to suggest to our readers that they scrap all magazines and wastepaper NOW. The problem is serious and our greatest shortage at this moment.—Editor

communications committee on which every major government agency interested in communications is represented concluded a report for presentation to the State Department's main postwar planning committee. But, because it was understood the Army and CAA had opposed the views of the Navy and FCC on the format of the proposed international merger, this special committee's report was felt to be nothing more than a basis of further discussion without any conclusive determinations yet formulated.

War Surplus

THE Surplus War Property Administration in a recent report expressed the view that surplus communications equipment should find "a ready market" in civilian use after the war. It listed the surplus apparatus potentials in this field as items which, to a major extent, could be adjusted or modified for civilian telephone operations without substantial expenditures or mechanical changes.

In the disposal of surplus equipment in foreign countries, the SWPA reported that Secretary of State Hull had classified "telecommunications equipment" as a category of military apparatus which "will have to be dealt with on a special basis."

Surplus War Property Administrator Clayton is constituting COMMUNICATIONS as one of the seven divisions of SWPA. Philip Condict, formerly associated with the International Telephone & Telegraph Corporation, is SWPA's communications consultant at present. The communications division still has to be fully established and it is possible that Mr. Condict will be named as its chief.

So far the SWPA and its affiliated government agency which handles capital goods surplus disposal, the Defense Supplies Corporation, has been engaged only in the planning of the best methods of surplus disposal so that it can test out its methods on the present comparatively small amount of Army-Navy surpluses. **The policy is to make the manufacturers in each field the agent of the government surplus disposal administration and to pay the manufacturers commissions for this work.** In this way, it is felt that the most orderly system of plowing back into civilian consumption and use channels of the surplus apparatus and parts will be effected and that it will prevent speculators and profiteers from entering this field. The contracts and methods of surplus disposal have been the subject of conferences between the Defense Supplies Corporation officials and leading executives of the telephone manufacturing industry, the latter being the members of the Telephone Equipment Manufacturers Advisory Committee of the WPB Communications Division.

It is felt strongly by the Army and Navy that surplus disposal and reconversion should not be engaged in actively except for "blueprinting" of the machinery because war production must be maintained at full speed to produce the "knock-out" punch in the European phase of the war. Lieut. General B. B. Somervell, Commanding General of the Army Service Forces, has just issued two warnings to American industry and labor to keep up military production on "the home stretch" of the war. In his June report, WPB Chairman Nelson revealed that wire communication, together with underwater sound and miscellaneous signal equipment, had declined 1% below May and had missed the scheduled requirements by 7%, but this deficiency was not as much as in the case of radio and electronic schedules.

Convention Dates

United States Independent Telephone Association, Stevens Hotel, Chicago, October 10, 11 and 12.

South Dakota Telephone Association, Hotel Widman, Mitchell, October 19.

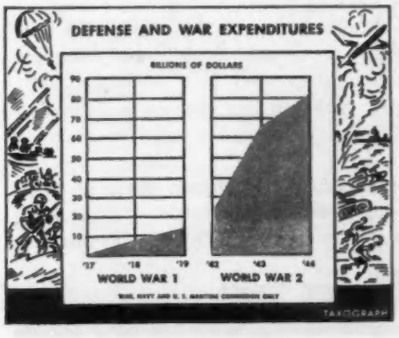
Virginia Telephone Association, Hotel Roanoke, Roanoke, October 26 and 27.

Alabama Telephone Association,. Hotel. Jefferson. Davis, Montgomery, November 13 and 14.

Missouri Telephone Association, place not decided, November 21 and 22.

Fly Indicates Departure From FCC

THE prospect of the retirement of FCC Chairman James Lawrence Fly from the helm of the Commission later this year is a subject which has aroused a great deal of interest and speculation among the industries under the regulation of that agency. In fact, there have been continuous rumors in the broadcasting industry during the past year or more that Mr. Fly was going to leave the government service, but in the main, these have been based upon "wishful thinking." The telephone industry and other branches of the communications field have not joined in this speculation to any extent, but if and when he does retire, the telephone industry naturally is vitally interested in who will take his place as Commission chief. (See item later in this column on Fly's statement.)



Posts in private industry and professions have recently attracted a number of leading FCC staff officials. Three top engineering officials have just left the Federal Communications Commission for industry. They are: Philip F. Siling, assistant chief engineer in charge of Broadcasting, who becomes engineer-in-charge of the Frequency Bureau of the Radio Corporation of America on October 1; Lewis Hayner, chief rate engineer of the Communications Carrier Branch of the FCC Engineering Department, who for many years was with the consulting engineering firm of J. G. Wray & Co. in the Independent telephone field and who now is establishing his own consulting engineering practice; and Howard Burroughs, who has become associated with the Automatic Electric Company. One lawyer of the FCC who was an expert in communications matters has recently joined the law firm of Carl I. Wheat who represents an important segment of the Independent industry.

Phone Manufacture

AFTER several months of unwinding governmental "red tape", all the Independent telephone manufacturing companies have now received the WPB authorization to commence limited production of telephone instruments for civilian use. The WPB and its Communications Division fought extremely vigorously for the civilian production, but the opposition of other governmental branches, particularly those charged with manpower problems, had to be ironed out due to some viewpoints, mainly theoretical, which blocked the inauguration of production in the two Independent manufacturing companies in Chicago. (Chicago is in a critical manpower area.)

However, shortly before TELEPHONE ENGINEER & MANAGEMENT went to press, it was authoritatively understood that these two companies—the Automatic Electric Co. and the Kellogg Switchboard & Supply Co.

—received approval to start civilian set manufacturing. Because of the delay these two companies cannot get their deliveries finished during the third quarter to any great extent, but any deficiencies in the third quarter quotas, it is believed, can be made up in the fourth quota production for 1944. Next year, if the fortunes of war are favorable, it is anticipated that the production quotas for both the Bell System and the Independent industry will be considerably increased.

Simplified construction procedures for telephone companies have been made applicable retroactively to construction authorizations issued prior to June 10. The procedures for new construction authorization were first established in June and the new rules applicable to telephone companies are contained in Direction 1 to Utilities Order U-3. (Reproduced in this issue).

To use the abbreviated allotment number U-2 instead of specific quarterly allotments previously issued, telephone companies can use for construction the U-2 allotment number for controlled materials and Class A products except in the purchase of 100 tons of carbon steel and copper wire and cable for jobs for which more than 25,000 pounds of copper wire and cable have been alloted for all quarters.

Nothing in the procedure makes it necessary for telephone companies to make any change in orders which they have already placed and the new procedure does not relax processing standards applied by the Office of War Utilities of the WPB. The procedure specifically forbids work on revoked or completed jobs and it forbids the companies to deviate from the particular job described and approved in the application Form WPB-2774. It also forbids the use of any kind, type, size or capacity of materials and equipment other than those previously approved, but continues in effect all special conditions or exceptions attached to the original approval.

However, the new procedure does eliminate a considerable amount of materials accounting heretofore required. It also reduces the number of amendments required to be filed for permission to use small additional amounts of materials. **(See text of Direction 1 to U-3 Order appearing in another portion of this issue).**

B. C. Burden to Engage in Consulting Engineering Work

B. C. Burden

B. C. BURDEN, engineer for the United States Independent Telephone Association, has resigned his position and will resume residence in Lincoln, Nebraska, on August 15.

He will set up an office in Lincoln and will engage in telephone consulting engineering work with particular reference to the application of electronic principles to telephone equipment. Mr. Burden will also devote some time to publication work in connection with current industry problems.

TELEPHONE ENGINEER & MANAGEMENT welcomes Mr. Burden back to the operating field and we are looking forward to again being able to publish, under his authorship, feature articles on current operating problems. His articles have proven very popular in the past, and have been reproduced in foreign publications.

Mr. Burden has spent almost two years in Washington, having gone there in October, 1942 on loan to the Communications Division of the War Production Board from The Lincoln Telephone and Telegraph Company of Lincoln, Nebraska. When the National Association headquarters was moved to Washington from Chicago and the position of engineer created, arrangements were made with the Communications Division to obtain him for the position.

His work with the Association has accounted in no small measure for the success of the new Washington set-up. The various bulletins which he has prepared under the auspices of the War Activities, Postwar and Plant Committees have been very useful to operating companies. His talks at State and National telephone conventions have been "down to earth," understandable treatments of current and postwar telephone problems that were exceptionally well received.

As the Association representative on the Radio Technical Planning Board, Mr. Burden has been entirely realistic and practical in viewing the future applications of radio in the telephone industry. He has warned against either "sticking our head in the sand" and saying that radio will play no part in postwar telephone plant, or the contrary view, that radio will displace wire and cable and solve all our problems.

Those of us who are familiar with "Bernie's" Nebraska holdings are not surprised that he finally succumbed to the urge to return to his home state so as to be close to what he calls his "Poor Man's Estate." This is his 50 acre "ranch," located on the banks of the Missouri River near Omaha and complete with everything from a Hollywood type swimming pool to a 30-foot cruiser. Located in a beautiful wooded setting, with duck hunting, fishing and boating at his front door, the "ranch" makes an ideal spot to either relax or to write about the telephone business.

We're not hinting, but your editor is expecting an invitation some of these postwar days (which incidentally are getting closer) which reads: "Dear Ray: Could you come out and spend a few days with me boating, hunting, swimming, talking shop, etc. . . . . ."

Here's wishing you success, Bernie, in your new venture.

FCC Chairman Fly

LIKE the cryptic declaration of the late President Coolidge on his 1928 presidential plans of "I do not choose to run," FCC Chairman James Lawrence Fly had both government officials and the communications-broadcasting industries in a puzzled quandary with his recent statement issued to counter "unreliable" rumors about his resignation from the Commission. The best guess was that he was going to leave the FCC helm within a few months, possibly around the period of the November election.

(Please turn to page 38)

Conducted by the
Observer and his Gang

THE Observation Tower

If you have observations or even a friendly bit of argument suitable for use in this column, you are invited to send them along, which automatically makes you a member of the Gang. You will be anonymous—no names of telephone people or telephone companies are used in the column. Address "The Observer", in care of TELEPHONE ENGINEER AND MANAGEMENT.

An Experience in Postwar Forecasting

A Gang Member has told us of the experience of his company in the proposition of trying to figure out how many stations it will have in service shortly after the end of both the European and Japanese wars.

The company operates a number of exchanges, some of which are in a territory considerably affected by war manufacturing and other war activities. Like most such companies, it has had a much higher than normal gain in stations since 1939, and also now has a much larger than normal list of unfilled applications for telephones.

The management set out to calculate, as nearly as it could, the effect the end of the wars would have on its number of stations in service. The bright minds of the organization were called to the task and they went about it in a very systematic way.

They made an exhaustive study of their held orders, and estimated how many of them would fade out before they could ever be taken care of. They checked up on new subscribers and calculated how many of them were newcomers to the territory who would likely move away after war activities ceased there, and how many of them would likely give up their telephones for other reasons, such as a drop in their income and so on.

They took into consideration the number of past subscribers who had moved away from the operating territory during the war, to engage in war work elsewhere or to enter the armed service, etc., and considered how many of them would likely come back home and want telephones after the war.

In fact, this management took into account everything they could think of that had influenced, during the war period, increases and decreases in the number of stations they had in operation; they gave each factor due weight, and finally arrived at a conclusion.

The strange thing about the conclusion, said the Gangster—at least it seemed strange to him and it seems strange to us too—was that when everything had been duly totted up and all the deductions made, the result was that the company would, according to these calculations, have in service shortly after peace comes just about the same number of telephones it would have had in service, according to its prewar growth curve, if there had been no war at all.

On second thought, however, the result of this survey is not so strange after all. Loss or gain of telephone stations in normal times comes about through shifting and other changes in the population, plus changes in the status, financial and otherwise, of the population. In the settling down process after the war, many people who have shifted around for one or another war reason will gravitate back to the old home town to stay. It may be that in a lot of cases the town will gradually resume its regular process of growth or lack of growth that was interrupted by the war.

We don't know definitely, of course. Our Gangster admits that he and his company associates don't konw either. "Our study of the subject was interesting," he says, "but, after all, it is not much more than what the engineers call an 'informed guess.' "

So, on that basis, we give it to you for what you may think it is worth.

Speaking of Engineers

On the matter of engineers and their "informed guesses"—the latter being their name for something they are not able to figure out to their full satisfaction—we are reminded of the engineer (probably a telephone engineer) who told a friend about a marvelous piece of machinery the engineer had bought and installed in his home workshop.

"It works this way," explained the engineer in customary engineer language. "By means of a pedal attachment a fulcrum lever converts a vertical reciprocal motion into a circular movement. The principle part of the machine is a huge disc that revolves in a vertical plane. Power is applied through the axis of the disc, and the work is done on the periphery, and the hardest steel by mere impact may be reduced to any shape."

"Gosh!" exclaimed the friend, his eyes popping. "I'll have to come over and see that machine!"

So he hurried over to see this wonderful piece of machinery. It was a grindstone.

Postwar Government Controls

A Gang Member who has ideas of his own about practically everything has been spouting off to us about postwar government controls.

He points out that a lot of the big minds of the country keep telling us that rationing of many things and a lot of other kinds of the now existing wartime government controls, including War Production Board controls, will have to be continued for some time after the end of both wars and tapered off gradually.

The purpose of this is, of course, to allow an orderly and therefore gradual transition of the country from a war time to a peacetime basis, and to combat inflation.

"Maybe it is a good plan," admits this Gangster. "But, in my opinion, if the big shots in Washinton think they can keep all these artificial wartime controls going very long after the war ends, they've got another think coming."

"In other words," he continues, "they just don't know the American people. The people will stand for almost anything, whether they like it or not, to get Hitler and the Japs licked good and properly. But when the fighting is over there are two things they are going to want, and they'll want both of 'em quick. One is to get their boys back home. The other is to get rid of all this rationing business and such things as manpower and wage stabilization and all other kinds of wartime government controls."

"The American people," opines this Gang Member, "just weren't raised up to understand why anybody in Washington or anywhere else should tell them how to live their lives in peacetime. And I think they'll make plenty of noise about it if government controls affecting individuals aren't either abolished or greatly relaxed pretty soon after the fighting ends."

If this Gang Member is right in his conclusions, the telephone industry has something to think about. Most applicants for telephones have been patient and understanding when the telephone company explains why the service cannot be supplied now as promptly as it would be supplied in normal times. But there's a war on now.

What is going to be the attitude of these applicants if they are still unable to get a telephone, excepting after long delay, when the fighting has ended?

Something Ought to be Done About This

Gang Member No. 111 has complained to us about big-city telephone directories. Says he's in the telephone business and hates to complain about anything connected with it, but when he was visiting a big city last month he tried to find and call a telephone number from a booth. The print in the directory was so small, and the light in the booth so bad, he avers, that even with his Sunday bifocals on he couldn't read the number he wanted.

We told him we'd heard the complaint before, and we understood a number of people were trying to find out how to do something about it. Somebody, we understand, has figured out a gadget for magnifying directory listing on a screen—sort of like the old magic lantern.

These colossal big-city directories with their small print—due partly now, of course, to the paper shortage—are a botheration to a lot of people and something the telephone industry should find a way of alleviating some day. Meanwhile the best advice we could give No. 111 was to carry a magnifying glass the next time he went to the big town.

Better Get Acquainted, Girls

Stop reading if you've heard this one, from "Telephone War Digest":

"Who are you?" is a question familiar to telephone operators working on the two ends of a long distance line, when a third operator's voice is heard. Two experienced girls, trying to reestablish a broken connection on a line which stretched a good part of the way across the country, got an unexpected reply to their question. "You wouldn't know me," was the answer. "I'm a new girl, and I'm way out in Wyoming."

California Telephone Official Returns from Army

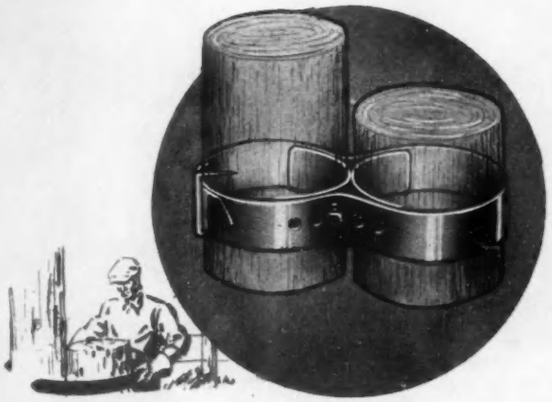
C. F. Mason, president of Associated Telephone Company, Ltd. at Santa Monica, California, has announced the return from Army service of Harlan W. Holmwood, former secretary and treasurer of the company. Mr. Holmwood was elected vice president and director at the July 26 meeting of the board of directors and will be responsible for executive affairs of the company with particular attention to matters of personnel, according to Mr. Mason.

Upon graduation from the University of California in 1924, Mr. Holmwood accepted an appointment as Second Lieutenant in the Air Reserve of the Army and subsequently participated actively in reserve officer training which included flying at various Army Air Bases in California. When called to active service in 1942 shortly after Pearl Harbor, he held the rank of Captain and six months later became a Major. His duties in the Army took him to Alaska and the Aleutians, he was based for a time at Seattle, Washington and at Sacramento, Fresno and Merced in California and for two months at Baltimore, Maryland, where he was detailed for duty with the Signal Corps because of his telephone background. During July he was relieved from active duty with the Army at his own request and reverted to inactive status under a current policy of the War Department which permits officers over 38 to submit such requests.

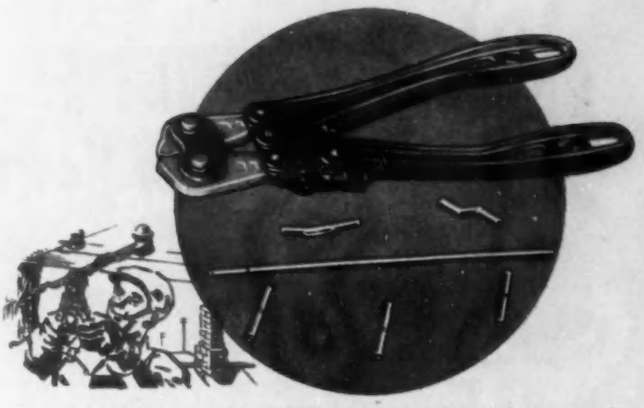
Major Harlan W. Holmwood

Except for his absence while in military service Mr. Holmwood's employment with the company has been continuous since October 29, 1938 when he started as a clerk in the auditing department of the Santa Monica Bay Telephone Company. Shortly after the Santa Monica company and other predecessor companies were consolidated to form Associated Telephone Company, Ltd., he became assistant to the general auditor. In April, 1935 he was elected assistant secretary and assistant treasurer and a year later was elected secretary and treasurer, the position he held at the time of his departure for active service.

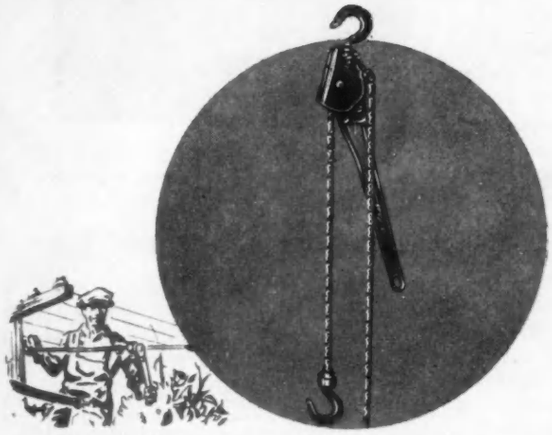
HELP! Paper is Precious Scrap It NOW!



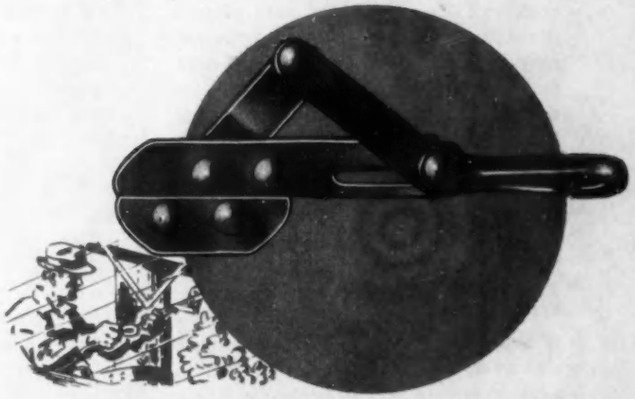
POLE STUBBING CLAMP—Brace old poles with short stubs and two Samson Stubbing Clamps. Clamp includes two heavy steel bands, a saddle assembly, and a special staple.



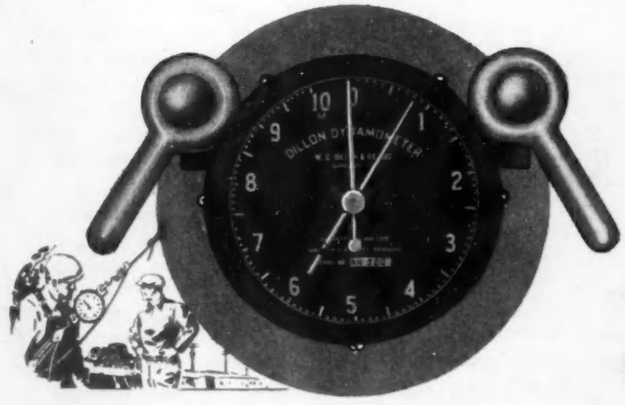
NICOPRESS SPLICING SUPPLIES—These tools and sleeves permit quick repairs on line breaks and bad joints. Standard and extra-length sleeves for all telephone wires.



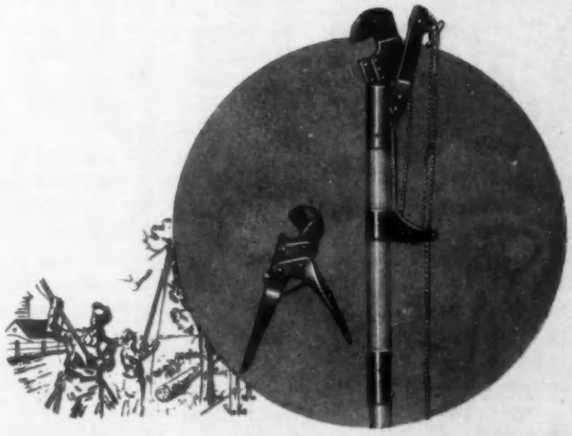
COFFING HOISTS—These chain ratchet hoists are powerful pullers, but are light in weight—easily carried up on the pole for pulling wire, messenger strand, etc.



BUFFALO WIRE GRIP—This simple grip slips easily onto the wire, holds tight when pull is applied, does not mar the wire. Eye fits over hooks on hoists or block tackle.



DILLON DYNAMOMETER—You lengthen the life of wire or strand when you use just the right tension. Dillon Dynamometers assure accuracy in this important detail.



NEWMAN TREE TRIMMERS—Their "cycle-cutting" operation permits quick, easy cutting, and smooth, clean cuts. Pole and hand types—for branches up to 1½" in diameter.

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Highlights of the Communications News

(Continued from page 32)

But one could read all sorts of interpretations into the 97-word statement of the Commission chieftain. There seemed every evidence that he was planning to leave government service and to enter the private practice of the law, but **when** was the enigma.

Some thought it might be within 90 days or about the time of the November presidential election, but others speculated that, if President Roosevelt were reelected, Mr. Fly might hold himself in readiness for duty in the peace settlement negotiations on international communications. In the latter case it is thought that he could reenter private life and be called back to government duty for a special peace negotiations assignment. It is believed that he has already been approached to be a legal adviser in aviation communications and to the Muzak company which furnishes wired radio in a number of large cities.

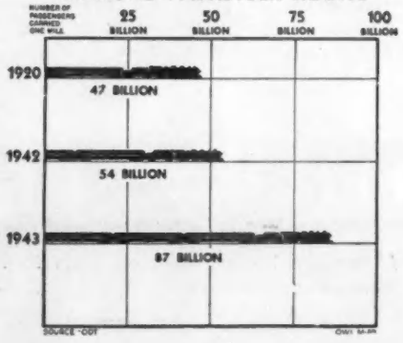
The most concrete portion of Mr. Fly's statement was the concluding sentence —"at the moment I have no definite plans except to remain here (the FCC) for some substantial period of time." He cited that "there are a few jobs to finish around here and **I propose to see** them finished."

It was speculated that the "unfinished" business was undoubtedly and foremost the postwar radio frequency allocations plan, the future of television, then as a "headache" for the Commission, the determination of the controversial broadcast program handling which will bob up with increasing intensity between now and the election and finally as a subject which he has stressed and fought for, the international communications-merger situation. However, the latter problem appears definitely slated to be before the interested government agencies and Congress for many months. This is evidenced by the fact that a report and plan containing divergent views of the participating government agencies which now is only somewhat of a stage for inauguration of discussions is just now before the State Department Postwar Planning Committee and will not be taken up by that body for another month or so.

As the odds now stand, Commissioner Clifford J. Durr, the intellectual leftish liberal member of the Commission, is favored to succeed Mr. Fly at the FCC helm. President Roosevelt, if reelected, might well consider the designation of Mr. Durr for the post because of the Commissioner's wife, sister of Supreme Court Justice Hugo Black, who is now actively working for the fourth term as a member of the National Citizens' Political Action Committee. But Commissioner Durr might prove persona non grata in Congress, especially before the House, because he conducted a fortright and unprecedented fight for the removal of Rep. Cox of Georgia from the chairmanship of the FCC investigating committee right up to Speaker Rayburn, and these tactics left some very sore feelings among the veteran Southern Democratic Representatives. Then, too, Mr. Durr's close relationship with the CIO could mean tough hurdles on both sides of Capitol Hill unless the election changes drastically the complexion of the Senate and House. Possibly to avoid complications with Congress, the President, who has the power to designate the Chairman, might select an Independent like Commissioner Jett or a Republican like Governor Case or would name his candidate for the FCC vacancy to the agency's chairmanship. (The White House so far has given no indication as to the new FCC Commissioner to succeed Commissioner Craven.)

The text of Chairman Fly's statement follows: "In view of the unreliable rumors as to my resignation from the Federal Communications Commission, I should like to set this matter at rest. I have been in the Government service for a continuous period of fifteen years. For some time I have been conscious of personal considerations which indicate the wisdom of my returning to the private practice of the law. However, there are a few jobs to finish around here and I propose to see them finished. At the moment I have no definite plan except to remain here for some substantial period of time."

RAILROAD PASSENGER TRAFFIC



C. C. Donley

R. S. Brewster Retires; Donley Named Traffic Superintendent

C. C. Donley was named general traffic superintendent of The Lincoln Telephone and Telegraph Company in an announcement July 31 by John H. Agee, vice president and general manager. In this position he will have under his direction local and long distance traffic operations in all of the 121 exchanges served by the company in the 22 southeastern counties of Nebraska.

Mr. Donley assumes this position with a background of more than 34 years of service in the telephone business. His recognized executive ability and practical knowledge of the industry admirably qualify him to assume the responsibilities attendant to this important office.

His telephone career began in July, 1910, six years after the founding of The Lincoln Telephone and Telegraph Company, when he was employed in Lincoln as a lineman. His advancement through the organization was rapid, and he successively acted as installer, switchboard man, toll test man, and district inspector until his appointment as toll wire chief in March, 1920. He was advanced to the General Traffic Department in September, 1922 when he was made traffic engineer, and in September, 1937 was promoted to assistant general traffic superintendent, the position he has held until his present appointment.

He has for many years taken an active interest and part in employee affairs, and at present holds offices in two associations of employees. He is a member of the Independent Pioneer Telephone Association.

R. S. Brewster

R. S. Brewster retires as general traffic superintendent after having held this position since February 16, 1921. He joined The Lincoln Telephone and Telegraph Company during the first year of its organization in 1904, and has served continuously since that time, with the exception of a short term of employment from 1910 to 1912 as inspector of the Nebraska Bell Telephone Company. He was the original long distance telephone operator for the company, having the distinction of operating the first toll board to provide long distance service from Lincoln. This occurred in 1908, at which time the only long distance circuits available ran to Havelock, Louisville, and Plattsmouth.

For the past few years Mr. Brewster has been interested in research and the development of telephone services. He plans to pursue his endeavors in these enterprises and will continue residence in Lincoln.

Installing Equipment At Bloomington, Ill.

Installation of an additional 1,300 lines of central office dial telephone equipment to serve more than 2,000 subscribers is approximately 30 percent completed, R. B. Still, vice president and general manager of the Wabash Telephone company announced recently.

Final installation of the new lines together with other improvements that will double the inward long distance reception and offer an improved ringing system, will be completed by Jan. 1, Mr. Still predicted. Equipment for the 1,300 lines, recently released, has been held in storage since July, 1942, because of War Production Board restrictions.

PICTURE OF ONE "GUY" THAT DOESN'T HAVE TO WORRY

Yes, the "guy" that's held by Line Material Pole Line Hardware is perfectly safe. There's no question about it . . . the anchor rods, strain plates, thimbles, eye bolts, protectors or clamps will hold if they're L-M. This is true of all Line Material Hardware, regardless of adverse conditions.

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EDITED BY J. S. REED JR.

Line AND Desk

(EDITOR'S NOTE: This is repeat of the first question which appeared in our July issue. We beg your pardon —we omitted the illustration.)

Q. How is it possible to obtain an audible ringing tone in a switchboard that does not have this feature?

A. The simplest way to obtain an audible ringing tone is to connect an .005-m.f. to .02-m.f. condenser in the cord circuit at the cord terminals between the answering and calling cords as shown in Figure 1. Part of the ringing current passes through the condensers to the calling party's line when the operator signals the called party, indicating to the calling subscriber that his party is being rung.

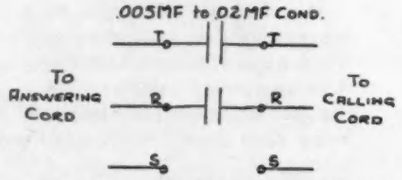


Fig. 1—Circuit for obtaining audible ringing in core circuits not already equipped with this feature.

Q. We are experiencing considerable trouble with lightning damage to our cable at junctions with open wire leads. Our present system of protection does not seem to prevent damage by frequent electric storms in our locality. How can more adequate protection be obtained?

A. The simplest and most effective method we know of at the present time to protect cable leads at junctions with open wire lines is to place

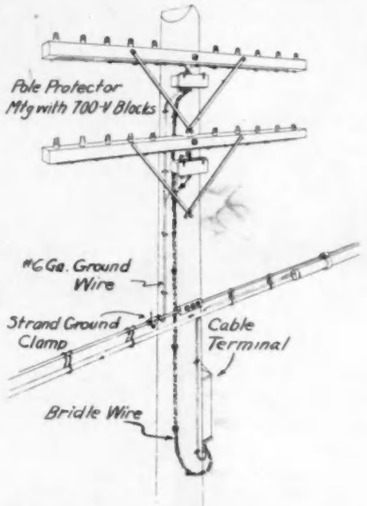


Fig. 1 (a)—Method of Mounting Pole Protector Equipment on the Junction Pole.

pole protector equipment on the junction pole. Figure 1 (a) shows how this is done, and Figure 1 (b) illustrates the wiring schematic. Protector blocks in the pole mountings are of the 700-volt, break down type. The protector ground strip is connected directly to the cable and in addition runs to a **good low resistance** ground at the pole. Grounding the cable sheath places the sheath at ground potential and effectively protects the cable pair insulation from puncturing or lightning discharges. The 700-volt blocks are adequate to protect the cable pairs since the paper insulation will not break down on voltages that discharge across the blocks. It may be advisable to place additional pole protector mounting equipment on a pole several pole spans further ahead in the lead to reduce the intensity and frequency of discharges across the block. The down guys on the cable lead should provide a direct metallic connection from the messenger strand to the anchor, and the cable should be bonded to the messenger. It is not advisable to employ fuses at the junction pole since they would do little good in protecting the cable.

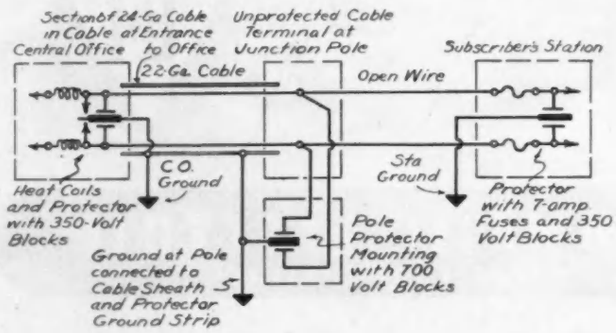

Section of 24-Ga Cable in Cable at Entrance to Office
Central Office
Unprotected Cable Terminal at Junction Pole
Subscriber's Station
22-Ga. Cable
Open Wire
C.O. Ground
Sta Ground
Heat Coils and Protector with 350-Volt Blocks
Protector with 7-amp Fuses and 350 Volt Blocks
Pole Protector Mounting with 700 Volt Blocks
Ground at Pole connected to Cable Sheath and Protector Ground Strip

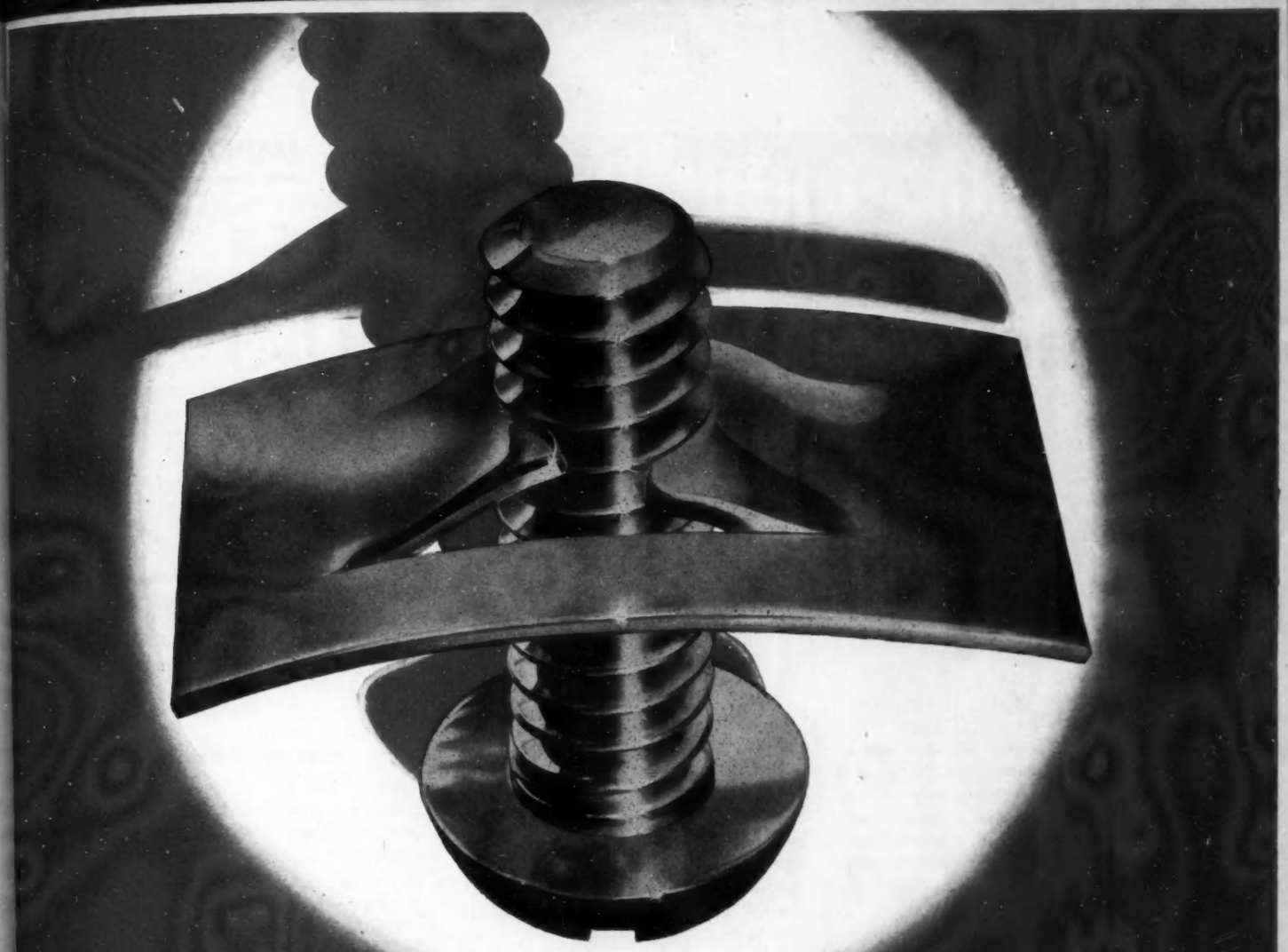
Fig. 1 (b)—Wiring Schematic of Pole Protector Equipment. (Protective Scheme Designed for Use with 22-Gauge Cable Terminating at Open Wire Lead.)

Q. We have been experiencing considerable trouble with ring cuts in aerial cable. What would be a simple way to eliminate this trouble?

A. We recommend the use of zinc strap cable hangers in place of the first one to three ring supports on each side of the pole in locations where ring cutting is experienced, the exact number to use depending on the severity of ring cutting in the particular location. The spacing of the strap hangers is the same as that of the original rings, 20 inches between rings and 10 inches on each side of the cable pole. The effect of the straps is to prevent the movement of the cable within the rings which is the primary cause of ring cutting. The straps are also effective in preventing the slipping of cable on grades and may be used instead of grade clamps for this purpose.

Q. How may alternating current be distinguished from pulsating current?

A. Alternating current can be distinguished from pulsating current by connecting a D.C. voltmeter of the proper voltage range to the output of the ringing machine and noting the action of the meter needle. Alternating current will cause the needle to vibrate in a small arc about the zero point on the scale, while pulsating current will cause the needle to move up scale if the proper polarity has been observed. The meter needle will also vibrate slightly at the point of reading.



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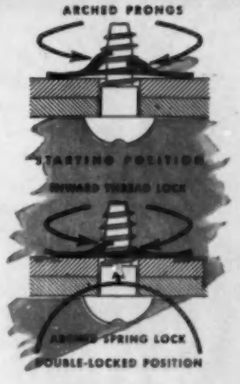

Speed Nuts* [PATENTED]

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FASTEST THING IN FASTENINGS

Text of

IMPORTANT

Direction No. 1-Order U-3

Issued By WPB July 31

Simplified construction procedures for telephone companies have been made applicable retroactively to construction authorizations issued prior to June 10, the War Production Board announced. The procedures for new construction authorizations were first established in June.

The rules applicable to telephone companies are contained in Direction 1 to Utilities Order U-3. Thus, the utilities orders authorize the new procedures, even though WPB's construction authorization issued prior to June 10 does not indicate on its face that they are applicable to the particular project.

Under the new procedure, the affected utilities are authorized:

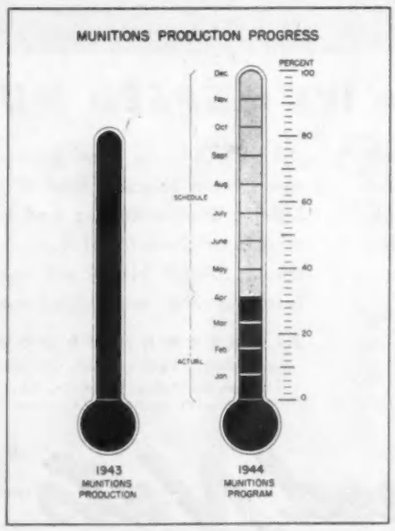
1. To use the abbreviated allotment number U-2 instead of specific quarterly allotments previously issued, except for allotments in excess of 100 tons of steel or 10,000 pounds (25,000 pounds in the case of telephone and telegraph companies) of copper wire and cable.
2. To use and purchase larger quantities of materials and equipment than were authorized on approved applications, if these are of same kind, type, size and capacity as were approved, and if they are required for the job.

Nothing in the procedure makes it necessary for utilities to make any change in orders which they have already placed.

This procedure does not relax processing standards applied by the Office of War Utilities. It specifically forbids work on revoked or completed jobs. It forbids utilities to deviate from the particular job described and approved in the application Form WPB-2774. It forbids the use of any kind, type, size or capacity of materials and equipment other than those previously approved. It continues in effect all special conditions or exceptions attached to the original approval.

The procedure does, however, eliminate a considerable amount of materials accounting heretofore required. It should also reduce the number of amendments filed for permission to use small additional amounts of material; for changes in quarter of allotment, and for similar variations in WPB-2774 applications issued before June 10, 1944, WPB officials said.

We reproduce herewith the direction as issued:



Text of Order

Direction 1 to U-3, July 31, 1944, War Production Board, Part 4501—Communications, (Utilities Order U-3, Direction 1)

(a) What this direction does. This direction makes applicable the simplified procedures provided for in the June 1944 revision of application form WPB-2774, to authorizations issued to operators on form WPB-2774 before the revised application form came into use.

(b) Provisions applicable to certain WPB-2774 authorizations. Except as noted in paragraph (c) below the following special provisions are hereby made applicable to all WPB-2774 authorizations issued to telephone operators and in effect on June 10, 1944, even though contrary provisions appear on the face of such authorizations:

(1) The applicant may use for the job authorized in his approved WPB-2774 application only materials and equipment of the kind, type, size and capacity listed in section III of his application and approved by the War Production Board, but he may use such materials and equipment in quantities required, irrespective of the quantities authorized on WPB-2774. No change may be made in the kind, type, size, and capacity of the materials and equipment listed in section III of the application and approved by the War Production Board, unless an amendment is filed and specific approval obtained. Nor may more materials and equipment be used than are required

for the construction, installation or purchase authorized.

(2) The applicant is authorized to use the abbreviated allotment number U-2 for the purchase of controlled materials and Class A products to the extent authorized for use by paragraph (b) (1) above, except for purchase of:

(i) Carbon steel for jobs for which more than 100 tons of carbon steel have been allotted for all quarters;

(ii) Copper wire and cable for jobs for which more than 25,000 pounds of copper wire and cable have been allotted for all quarters.

Where specific allotments of these two materials have been made in quantities which exceed the quantities indicated, these specific allotments remain in force, subject to the provisions of CMP Regulation 6 and the authorization under which the allotment was made.

(3) Operators are hereby authorized, without making formal return to the War Production Board, to cancel on their books controlled materials balances remaining from specific allotments other than those which remain in force under paragraph (b) (2) above.

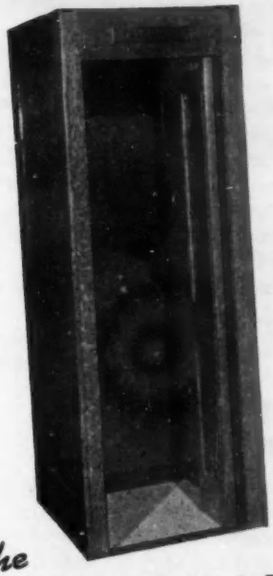
(4) The applicant is hereby authorized to use the preference rating assigned in his approved application for the purchase of quantities of equipment and materials (other than controlled materials) additional to those rated for purchase in the approved application, to the extent that such additional quantities are authorized for use by paragraph (b) (1) above.

(5) The abbreviated allotment number and preference rating authorized herein may not be used to order materials and equipment available in the applicant's inventory in excess of a practical working minimum. The allotment number and preference rating may be used to replace materials and equipment in inventory, but only to the extent that inventory has been reduced below a practical working minimum.

(6) The abbreviated allotment number and preference rating authorized herein must not be used to order materials and equipment earlier or in greater quantity than is required for the construction, installation or purchase authorized.

(7) Orders for controlled materials placed pursuant to this direction must show the abbreviated allotment number U-2 and must specify the month in which delivery is requested. Orders for Class A products shall be placed as provided in Direction 4, CMP Regulation 6. Orders for materials and equipment other than controlled materials to which the preference rating assigned herein is applied must also show

STROMBERG-CARLSON
RECOMMENDS—



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The CHURCHILL Booth is constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector.

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SYLVANIA TUNGSTEN TELEPHONE SWITCHBOARD LAMPS

ACTUAL SIZE

FASTER—Light up in one-fifth second.

BRIGHTER—Maximum end-on candle power. Sharper daylight signals.

STRONGER—Average life 1,500 hours of high brilliancy. Strong breakage resistant filament. Tight, correctly formed bases.

Available in: CLEAR
NATURAL RUBY*
NATURAL GREEN*

*While present supply lasts

SYLVANIA
ELECTRIC PRODUCTS INC.
SALEM, MASS.

Formerly Hygrade Sylvania Corporation

the abbreviated allotment number U-2 for identification purposes.

(c) Cases to which paragraph (b) does not apply. The provisions of paragraph (b) above do not apply to authorizations which were revoked or on which all authorized work was completed prior to the effective date of this direction. Nor do such provisions set aside or supersede any specific exceptions or conditions which were made in the blank space below Section V of any approved WPB-2774 application.

(d) Section headings on WPB-2774. References herein to "section III" and "section V" of form WPB-2774 may be considered to mean "section C" and "section E" respectively on an edition of Form WPB-2774 prior to that of February 21, 1944.

Issued this 31st day of July 1944.

War Production Board,
—By J. Joseph Whelan,
Recording Secretary.

Autry Named By Texas Company

Recently Roy Autry took over the duties of vice president and general manager of the Southwestern Associated Telephone Company, Lubbock, Texas. R. B. Fairly continues to head the organization as president.

Mr. Autry was born March 2, 1892 in Lampasas, Texas, and has a good many years to his credit in the telephone field. He was employed with the Santa Fe Railway Company in Cleburne, Texas, for four and one-half years before entering the employ of the Southwestern Bell Telephone Company March 5, 1915, where he served until October 31, 1930. At that time he resigned to accept employment with the Associated Telephone Company, Ltd., Long Beach, California. He held various positions with that company, including general office at Santa Monica, California. He transferred to Lubbock in April, 1944, as assistant to "Doc" Fairly.

Whitmore Named President Of N. Y. Telephone Company

Carl Whitmore, vice president (Operation) of the New York Telephone Company, was elected president July 26, at a meeting of the Board of Directors. He succeeds the late James W. Hubbell.

Mr. Whitmore began his telephone career 33 years ago as a fieldman with the Pacific Telephone and Telegraph Company in San Francisco.

In 1935 he became general plant manager for the Upstate Area of the New York Telephone Company, and in 1936, he was appointed vice president and general manager of the Long Island Area. On August 28, 1940, he was appointed a director of the company, on September 1, 1940, became vice president in charge of personnel. On August 1, 1941, he became vice president (operation) succeeding Mr. Hubbell who was elected president at that time. He was appointed to the Executive Committee in March, 1942.

Lieut. Gifford, Son of A.T.&T. President, Missing

Lieutenant Walter S. Gifford, Jr., USNR, the elder son of president Walter S. Gifford of the American Telephone & Telegraph Company, was reported by the Navy Department on August 1 to be missing in the Pacific airplane crash in which Rear Admiral Charles P. Cecil lost his life. The Naval transport plane crashed in a take-off from an unidentified Pacific base.

Lieutenant Gifford had volunteered for the Navy two days after Peal Harbor

Marco Polo would have had more to write home about if he had found telephones and LongLife Drop Wire among the wonders of ancient China.

Carefully kept records show that LongLife Drop Wire lives up to its name. Maintenance costs tumble and service is improved by its use.

Distributed by GraybaR

WB

THE WHITNEY BLAKE CO.
New Haven, Conn.
Well Built wires since 1899

on December 9, 1941, and was commissioned an ensign shortly thereafter.

After his graduation from Harvard College in 1939, he was engaged in journalism work on New York newspapers. He had prepared for Harvard at the Phillips Exeter Academy and prior to attending Phillips Exeter had attended the Buckley School in New York and the Fessenden School in Massachusetts. He lived with his father in New York. His brother, Richard P. Gifford is a Lieutenant (j.g.) in the U. S. Naval Reserve. His mother died several years ago.

Oscar M. Taylor

Taylor Selected By N. Y. Telephone Company

Oscar M. Taylor, vice president (personnel) was appointed vice president (operation) on August 2, to succeed Carl Whitmore, who last week was elected president of the New York Telephone Company. Mr. Taylor began his telephone career 37 years ago as cable splicer's helper with the Missouri & Kansas Telephone Company.

21—

A telephone man permanently assigned to an Army Post to handle communications (there are about 350 Bell System men on such jobs)) tells of a rush job to get a telephone in a certain part of the Post area "and we can't tell you what for" he was told.

Driving down a highway guarded by miles of extra M. P.'s he finally asked why all the extra precautions. "We don't know," was a soldier's reply, "but the band was practicing 21 rolls yesterday, and the President's the only one who's entitled to them."

STROMBERG-CARLSON RECOMMENDS—

The DIAMOND C MEANS LESS POLE REPLACEMENT

COLFAX Creosoted Yellow Pine Poles are carefully graded according to physical properties desired and treated with 8 lbs., or more if you wish, of Grade No. 1 Creosote Oil in accordance with AWPA specifications. Each pole is treated full length under pressure with the finest and cleanest creosote oil obtainable. This treatment will protect your poles for upward of thirty years.

Reduce losses in revenue due to pole failures—specify:

DIAMOND C

Creosoted Yellow Pine Poles

Mfd. by Colfax Lumber & Creosoting Company, Inc.

"Eveready" "Columbia" "Gray Label"

The quality cell preferred by telephone engineers

Long Life Telephone DRY CELLS

- Higher sustained voltage.
- Longer life.
- Rock-bottom economy.

These qualities, more important now than ever before, are assured through the constant supervision of America's largest dry battery laboratory.

Made by the makers of "Eveready" "Air Cell" Operators' Transmitter Batteries.

STROMBERG-CARLSON COMPANY

Factory and General Offices: Rochester 3, New York, U. S. A.

Branch Offices: Chicago, Kansas City, San Francisco, Toronto

COMMUNICATIONS and ELECTRONIC Developments

New Telephone Switching Unit

A new telephone switching unit of oustanding lightness and compactness which was developed by the Signal Corps makes it possible for Army communications men to set up emergency field switchboards in place of the previous bulky switchboards and has proved most valuable on the combat fronts, especially in the Pacific war area.

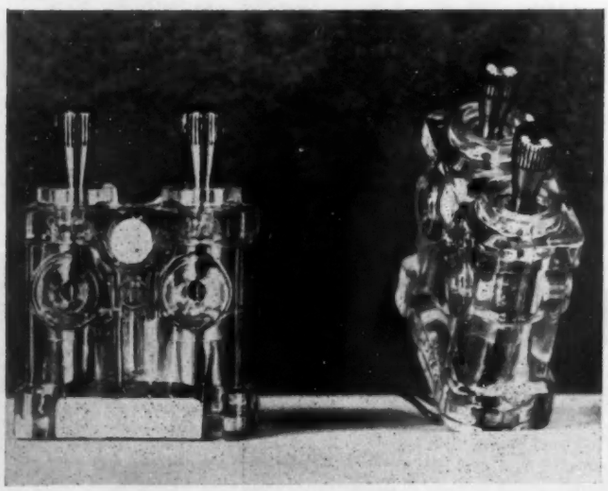
The unit is called "Adapter Plug U-4/GT" and may be used for terminating a local battery telephone line. Several plugs used together, along with a field telephone for the operator's set, provide a workable switchboard substitute which may be set up rapidly on a branch of a tree or any support which presents itself.

Weighing only 1 ounce or the equivalent of a letter carried for a 3c stamp, the U-4/GT's bulk is so small that the soldier-operator can easily carry a dozen or two of them in his pocket or in a pouch attached to his cartridge belt. This means the "makings" of a telephone switchboard in many a hot combat spot where a battery switchboard could not be carried. The unit is also moisture-proof so that it is invaluable for jungle or mountain operations, for which beach landing in tropical, rain-drenched areas and for airborne operations behind enemy lines.

The U-4/GT was developed in response to a most elementary need, felt especially in the Pacific Theater of Operations, of substituting a visual signal for the bell signal on regular switchboards, since the latter could be heard from considerable distances by enemy snipers. The greater use for effecting substitute emergency switchboards was a by-product of unforeseen importance. The visual signal is simple, the operator attaching the field wire pair entering his outpost to an adapter plug and connecting his telephone by a short length of field wire to another adapter plug. Incoming calls flash the lamp in the first plug and this signals the operator to make the connection with his telephone set.

The new adapter plug, which has been refined and improved from the early Signal Corps Laboratory models, consists of a small transparent plastic body with fasteners for line connections, a neon lamp that responds to ringing signals and two combination jacks and plugs for tandem connections between adapter plugs. The resistance and neon lamp are inside the plastic body, making them virtually impervious to moisture and fungus attacks. A luminescent identification plate on which the operator may write the line number, is embedded in the plastic.

The emergency switchboard is remarkably flexible in service. The operator can make not only individual connections but conference connections by calling individually the parties desired and connecting the adapter plugs in tandem. When a conversation has been concluded, the parties flash the operator who then disconnects the plugs.



The Signal Corp's new Adapter Plug U-4/GT weighs only one ounce but solves two communications problems. It substitutes visual signals for the telltale bell which attracts snipers' bullets, and in tandem combinations, used with a field telephone, it provides a compact emergency field. switchboard.

Phone Service Between Trains To Be Installed

An electronic telephone system, providing instantaneous and continuous voice communication between moving passenger and freight trains and wayside towers —and between moving trains themselves —is to be installed on the two main line four track divisions of the Pennsylvania railroad between Pittsburgh and Harrisburg, officials of the road announced August 6.

Combining principles of both radio and the wire telephone, the installation is designed as an extensive communications laboratory to advance the safety and efficiency of railroad operation. Approximately 300 passenger and freight locomotives, 90 freight cabin cars (cabooses), and six wayside towers along the 245 mile track stretch will be equipped with the train telephones.

The new installation, to cost 1 million dollars, was developed in association with the Union Switch and Signal Company. The system has been in experimental use on the Trenton-Phillipsburg branch of the road in New Jersey since 1942.

Road officials now will have an opportunity to adapt it to conditions in one of the heaviest railroad traffic areas of the nation.

This communications system will enable towermen in wayside stations to talk with all train crews moving in their areas, even though many miles distant, for the transmission of instructions, reports, and information pertaining to train operations.

On freight trains the conductor in the caboose and the engineer in the cab may talk to each other or with the crew of a train several miles distant. On passenger trains the system phones will be installed only in locomotives, the air whistle train signal taking care of intra-train communication. The passenger enginemen also will use the phones to reach other trains and towermen.

This radionic system utilizes high frequency alternating currents transmitted by induction to the rails and wires on poles paralleling the tracks.

The transmission paths are confined entirely to railroad property, instead of the universal paths of nature over which radio waves would travel. This system obviates the necessity of assigning radio frequencies from the limited range available in war time.

The system employs frequency modulation and so-called "carrier" currents for transmission. These currents remove any possible handicap in high static localities, such as electrified trackage or dense industrial areas.

No change will be made in the rules governing the movements of trains when the telephone system is used. The system will tie in with the most modern signaling and safety devices, including automatic block signals. In the New Jersey test it has reduced delays and is expected to do the same on the main line.

The General Electric company contributed to the research.

New Insulated Wire

Nubun, a new synthetic rubber latex insulation for power, lighting and communication cable has been developed by United States Rubber Company, it was announced by C. W. Higbee, manager of the wire and cable department, at a luncheon at the Biltmore Hotel, Thursday, August 3.

The new insulation is a result of war time developments in rubber technology and will permit the design of new types of wire and cable with improved electrical and physical characteristics.

Made by the now famous latex continuous dip method, Nubun will have great advantages over ordinary wire where replacement and space are important factors. Fire alarm, wire and cable police communication systems, as well as other highly essential telephonic systems will be more easily replaced and serviced and will have greater resistance to destructive forces which cause circuit troubles with the use of this type of wire, it was stated.

Qualities of Nubun insulation cited by Mr. Higbee include flexibility,

STROMBERG-CARLSON
RECOMMENDS—

Crapo
HIGH-TENSILE
LINE WIRE

For Long-Span
Low-Cost Lines

Construction costs are reduced to a new low level, maintenance expense is minimized, wherever Crapo HTL-85 and Crapo HTL-135 High-tensile, Low-resistance Line Wires are used. These revolutionary wires, with their superior strength, make possible rural lines with span lengths one and one-half to two and one-half times greater than were practical heretofore.

Crapo HTL-85 permits spans to 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures.

Crapo HTL-135 makes possible spans of from 350 feet in heavy to 500 feet in light loading districts. Both wires possess superior telephonic transmission qualities.

Crapo HTL-85

Crapo HTL-135

Write for technical data!

MINUTES SAVED
The Job Is RIGHT!

DILLON DYNAMOMETERS accurately determine the pound pull on power, transmission, and guy strand. Direct readings save valuable time. Ordinary workmen can easily operate the

DILLON DYNAMOMETER

Specifications:

- Mechanism not injured by overload
- 1/4" shatterproof safety glass crystal
- Will withstand full shock recoil
- Large, easy-to-read numerals
- Compact (8 1/4" x 6 1/4" x 3")
- Light in weight (8 lbs. 4 oz.)
- Galvanized shackles will withstand 25,000 lbs.
- Certified Accuracy
- Readings directly in lbs.
- Low Cost.

For Years of Reliable Service,
Insist on the
DILLON DYNAMOMETER

A Precision Instrument for
Precision Line Testing

Accurate
Dependable
Rugged

STROMBERG-CARLSON
PROGRESS IN TELEPHONY

STROMBERG-CARLSON COMPANY
Factory and General Offices: Rochester 3, New York, U. S. A.
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KEYSTONE

Telephone Line Wire

The wire that has excess zinc coating so the electro-galvanic action of zinc and water will provide a few extra years of service life out on the line.

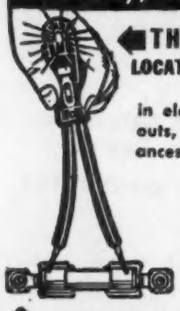
★ ★ ★ ★

Another of the Better Quality Products You Always Get from Suttle

DEPEND ON SUTTLE

Test-O-Lite

TESTS ANY VOLTAGE... 100 to 550 Volts, A.C. or D.C. —Safely, Swiftly, Surely



THE NEON GLOW LOCATES TROUBLE INSTANTLY

in electric circuits, fuses, cut-outs, motors, radios, appliances, etc.

PUTS "FINGER" ON THE TROUBLE SPOT

Indicates hot or grounded wires. Tells AC from DC. Far superior to ordinary clumsy test bulb. Indispensable in shop or home. Has PATENTED safety features. Vest pocket size with clip. Life time guarantee. List $1.50. (Priority A-7 required.) Purchase thru electrical dealers.

L. S. BRACH Mfg. Corp.
55-63 Dickerson St. Newark, N. J.

impermeability to water, laminated construction, and perfect centering of the conductor to produce an insulated wire of maximum conductivity and minimum diameter. The synthetic insulation is said to be exceptionally homogeneous following vulcanization and has high electrical characteristics such as di-electric strength and insulation resistance. The special synthetic rubber compound is low in specific conductive capacity, has good aging qualities because of the presence of special anti-oxidants, and will resist severe wear because by the nature of the latex process, the rubber particles are not distorted or broken down by milling.

Nubun insulation is made from a special modification of buna S synthetic rubber.

"Before the supply of natural rubber latex was curtailed," Mr. Higbee stated, "the United States Rubber Company chemists began investigating other possible insulating materials that could be applied to wire by the latex process. Of the materials then available, buna S in the form of latex seemed to present the most likely possibilities. However, buna S as then made was unsatisfactory for use as insulation applied by the latex dip method, particularly from the standpoint of electrical and physical characteristics. It was therefore necessary to modify and improve upon the basic buna S polymer before it could be applied to wire in the latex form and produce an acceptable insulating material. These improvements took the form of changes in the composition of the basic polymer, the process of polymerization and many other fundamental modifications.

"The standard GR-S rubber found most advantageous for the greater part of the government's program and for most military applications is based on a 75% butadiene-25% styrene composition. The modified polymer has a special styrene ratio and is prepared by a modified reaction technique which gives it improved processing and insulating properties."

According to the rubber company's engineers, the following electrical and physical values have been established by laboratory test: (bottom of page)

Leather Savings by the Army Signal Corps

A substantial contribution by the Army toward the conservation of critical material has been made by the Signal Corps through the adoption of a cotton fabric tool pouch to replace leather pouches. The latter, up to now, have been produced by the thousands and have required great amounts of cattle-hide leather necessary for shoes and other military essentials.

Approximately 2,500,000 feet of cowhide has already been conserved by the Signal Corps through the use of this same type cotton fabric in the production of field telephone cases and linemen's belts formerly made of leather. The treated fabric—developed by an industrial company at the request of the Signal Corps—is waterproof and mildew-proof. It is lighter and less absorbent than leather and has eliminated the necessity for harness dressing which leather requires to keep it serviceable.

TABLE

Physical Tests	Before Aging	After 96 Hour Aging Oxygen Bomb
Tensile Strength	2500#	2000#
Elongation	2-13 inches	2-11 inches
Set	5/16"	
Electrical Tests		
Voltage breakdown after submersion in water at room temperature.	650 volts/mil	
Insulation resistance constant K after submersion in water at room temperature.	54,000	
Specific Inductive Capacity at 70°C		
a. After one day in water	3.0	
b. After three days in water	3.2	

Mrs. Bellamy Passes

Mrs. Mary Alice Bellamy, 85, Knoxville, Iowa, wife of the late J. S. Bellamy, died July 23 at her home in Knoxville. The Bellamys were pioneers of that city, having organized the first electric company in that city in 1887 and later the first telephone company in 1898. Mrs. Bellamy had been president of the Bellamy Telephone Company since the death of Mr. Bellamy.

Earle D. Bellamy, a son, has been operating head of the company since the death of his father. He is prominent in telephone circles in Iowa and a director of the Iowa Independent Telephone Association.

The late Mr. Bellamy was also active in telephone affairs and was a past president of the Iowa Association. He built several exchanges during his career. Mrs. Bellamy was a social leader and active in all civic affairs in Iowa.

L. T. Hayner of FCC Enters Private Practice

L. T. Hayner, engineer in charge of telephone and telegraph rates for the FCC, July 17 resigned his position with the commission to enter the consulting engineering field with offices in Washington. It is understood that Mr. Hayner will be a consultant on a certain problem for a major communications company and also has been engaged as an engineering expert by the Alabama and New Jersey commissions for telephone rate investigations which the latter has under consideration.

A member of the FCC engineering staff since 1941, Mr. Hayner has been in charge of all important engineering work involving interstate and foreign wire and radio telephone and telegraph rate matters as well as other regulatory problems coming before the commission. While employed by the FCC, Mr. Hayner also had assisted various state regulatory commissions on telephone rate problems, notably the Washington State case.

He enters the consulting field with a wide and extensive background in communications. Prior to coming to the commission in 1941, he did special engineering work for the Washington State and Wisconsin commissions and also for Independent telephone companies. He served as a staff member of the FCC Special Telephone Investigation as engineer in charge of its Rate and Research Department. For many years, he was a staff member of the consulting engineering firm of J. G. Wray & Co. of Chicago, which is the leading firm in the Independent telephone field.

STROMBERG-CARLSON
RECOMMENDS—

FLIGHT OF TIME
. . . means nothing

No. 9 Hemingray with drip point petticoat for fast moisture run-off.

HEMINGRAY Insulators are made with scientific control of annealing, assuring great mechanical strength, no internal strains or stresses, giving long life with no deterioration.

HEMINGRAY'S tough Insulators will stand rough handling. Non-porous, they are impervious to moisture absorption. Clear and flawless, the Insulators are easy to inspect.

Long service plus initial low cost assure you of very small operating costs.

Insist on HEMINGRAYS
"FIRST IN GLASS"

AVAILABLE NOW!

HABIRSHAW No. 17
BRONZE DROP WIRE

Now Available for Immediate Shipment from Stock

High strength bronze conductor . . . expertly blended synthetic rubber insulation . . . soft, unbleached cotton braid, thoroughly saturated to provide a long-lived moisture-resisting covering.

A Quality Product Made by
Phelps Dodge
Copper Products
Corporation

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Division

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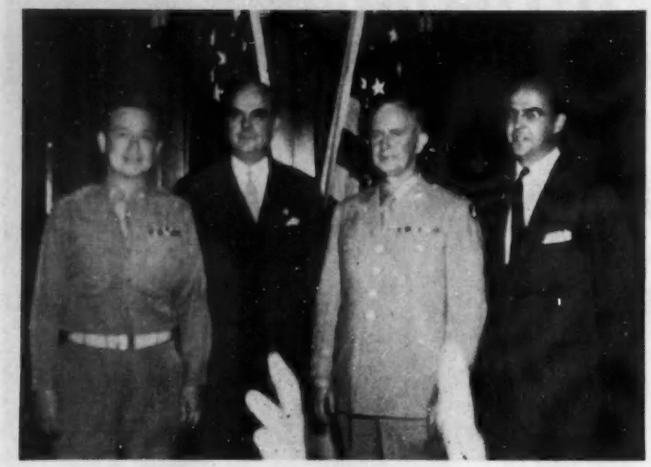
Certificate of Appreciation is Presented at Chicago Luncheon



Principals of the presentation of citation to Hunter L. Gary. Major I. R. Quay; Mr. Gary; Col. Leland H. Stanford, Signal Officer, 6th Service Command; and Theodore S. Gary, chairman.

AT a luncheon held in Chicago on Friday, July 28, Mr. Hunter L. Gary, chairman of the board of Associated Telephone and Telegraph Company and chairman of Theodore Gary and Company, was honored by the official presentation of the Chief Signal Officer's Certificate of Appreciation, in recognition of "loyal and patriotic services rendered the Signal Corps of the Army of the United States". The award was presented by Colonel Leland H. Stanford, Signal Officer, Headquarters of the Sixth Service Command, acting on behalf of Major General Harry C. Ingles, Chief Signal Officer, in the presence of a gathering of other Army officers, and representatives of Automatic Electric Company and affiliated companies.

Chairman at the presentation ceremony was Mr. Theodore S. Gary, son of Mr. Hunter L. Gary and vice president of Automatic Electric Sales Corporation. In introducing Colonel Stanford, the chairman reviewed his career in the Signal Corps, and paid tribute to the outstanding service he has rendered on many fronts at home and abroad.

In presenting the certificate and its accompanying emblem, Colonel Stanford spoke of the important services rendered by Mr. Gary during 1942—services which were "above and beyond the normal requirements of duty". Two outstanding examples of his cooperation, Colonel Stanford pointed out, were his success in obtaining an engineer having technical and linguistic abilities with actual residence in certain foreign countries in connection with his line of endeavor, and making available to the Chief Signal Officer a distribution expert to assist in solving problems involved in the shipment of Signal Corps equipment overseas.

Mr. Gary, in responding briefly, extended appropriate thanks to the Chief Signal Officer and his staff, and paid tribute to them and to his associates for their cooperation in making his efforts successful.

The chairman closed the presentation ceremony by conveying a message of congratulations from Mr. Theodore Gary, father of the recipient; and by reading a telegram from Admiral Stanford C. Hooper to Mr. Hunter L. Gary, calling attention to the long cooperation which Mr. Gary had extended to the War and Navy Departments over a period of many years.

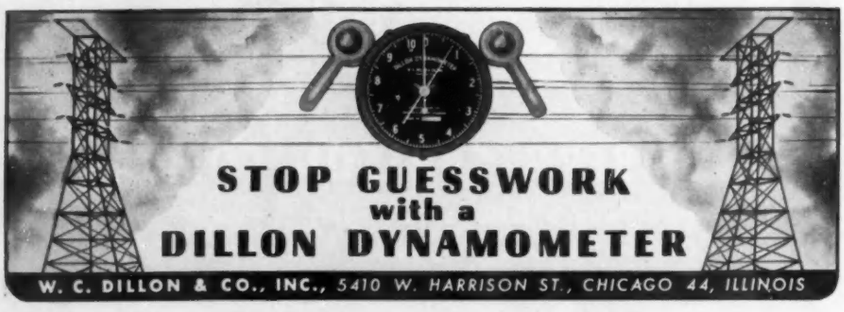
Mr. Gary receives from Col. Stanford the Chief Signal Officer's Certificate of Appreciation during luncheon at the Chicago Club.

Standardizing Army-Navy Specifications For Communications Equipment

Within recent weeks impressive progress has been made in standardizing Army and Navy specifications for many items of communications equipment. Reports to Major General H. C. Ingles, Chief Signal Officer, indicate that over fifteen hundred qualification approvals have been coordinated between the Signal Corps and the Bureau of Ships.

Two new agencies have been handling this standardization. The first is the Signal Corps Standards Agency which was organized pursuant to a joint agreement between Lt. General Brehon Somervell, Commanding General, ASF, U. S. Army, and Vice Admiral Robinson, OP & M, U. S. Navy. The Bureau of Ships installed permanent representatives to cooperate with this new agency, but this form of cooperation has been supplanted by a second organization called Army-Navy Electronics Standard Agency. Both are at Red Bank, New Jersey.

Standard specifications covering the major components and materials of communications equipment have been prepared and approved for joint procurement and already very substantial savings, both of time and money, have been effected. In each instance only one agency makes the qualification tests and forwards data to other interested agencies as a basis for approvals. In the case of plastics, for instance, this is done by the Bureau of Ships, and in the case of dry batteries it is done by the Signal Corps. Specifications on these and other materials are being processed as joint Army-Navy Standards and will be used by all of the Services of the Army and all of the Bureaus of the Navy. Joint inspection of equipment and coordination of waivers are similarly replacing the duplication of former days.



Central Electric & Telephone Segregates Telephone Companies

The stockholders of the Central Electric & Telephone Company have approved a corporate rearrangement and financing plan under which a new company, the Central Telephone Co. (Delaware) will acquire in exchange for its bonds, preferred and common stock all the telephone properties of the Central Electric & Telephone Co.

The Central Electric & Telephone Co. operates telephone companies in North Dakota, South Dakota, Nebraska, Minnesota, North Carolina, Iowa, and West Virginia and has two subsidiaries, the Virginia Telephone & Telegraph Co. which operates 22 exchanges in Virginia and the Iowa-Illinois Telephone Co. which operates 23 exchanges in southeast Iowa and western Illinois. It is understood that a further expansion of its telephone operations is in prospect in the east.

The electric, gas and water properties of the company are to be consolidated under the new Central Electric and Gas Co.

The Central Electric and Gas Co. is to purchase at 105¾ through an arrangement with the institutional bond holders the $3,100,000 of 30-year 3½ percent bonds of Central Telephone Co. Central Electric has arranged the private sale to institutional bond holders of $2,000,000 worth of 3½ percent bonds at the same price. With the addition of $363,500 of cash now on deposit, the funds realized from these sales will provide the amount needed to redeem the present $5,350,000 of 3¾ percent bonds of Central Electric & Telephone and to provide funds for other purposes.

Phone Operators At Seneca Honored

Alma Gordon, Helen Whittaker and Lillian Milus, phone operators in Seneca, each received the Illinois Bell Telephone company's bronze Vail medal and $100 in cash at a luncheon at the Starved Rock lodge recently.

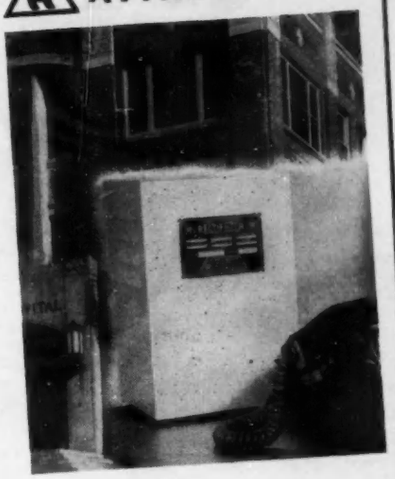
The awards were made to the operators for not leaving their posts of duty in Seneca on Jan. 22, 1943, when they were in peril from a $150,000 fire.

New Gun Director

Said Major General Campbell, Chief of Ordnance, United States Army, at a demonstration of Bell Laboratories' new M9 gun director: "They (American troops in the South Pacific) only fired 88 rounds and knocked down 12 out of 16 bombers. * * * In World War I, we used to hit a plane, not knock it down, for every 17,000 rounds."

STROMBERG-CARLSON
RECOMMENDS—

RAYTHEON



When life depends on uninterrupted telephone service

. . . Raytheon RectiFilteRs
(battery eliminators)
provide dependable power

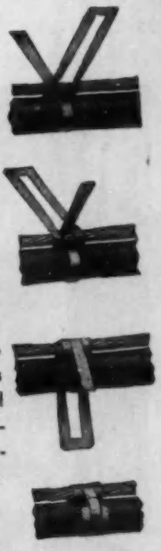
Uninterrupted telephone service in hospitals is vital for protecting health and life. That is why so many hospital administration executives and telephone companies select Raytheon RectiFilteRs for the power supply. They know from experience that Raytheon RectiFilteRs always provide dependable power whether the traffic demands be light, normal or heavy. And because RectiFilteRs provide uniform D.C. output voltage, they assure proper operation of automatic telephones. Raytheon RectiFilteRs are entirely automatic in operation . . . they have no moving parts . . . and require no maintenance.

A complete bulletin showing the advantages of Raytheon RectiFilteRs is available on request. Write for a copy.

PREVENT
Early Cable Discard by Eliminating
- SHEATH CUTTING
- CREEPING and
- RUSTING

With
Reliable
ZINC CABLE HANGERS

Prolong the life of your cables at least for the duration—rehang them, although they may be badly worn, with Reliable Zinc Cable Hangers. All cable movement that results in wear and sheath cutting is eliminated. Added protection against lightning is provided—cable bound and solidly grounded to the messenger. Reliable Zinc Cable Hangers are strong, economical and easily installed. Request complete information and prices.



★

"RELIALBLE" IDENTIFIES THE QUALITY

The four simple steps above clearly illustrate the simplicity of a Reliable Zinc Cable installation.

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Personalities IN THE NEWS

F. V. Rhodes, secretary of the California Independent Telephone Association, has notified us that the Certificate of Appreciation presented by the War Department through Chief Signal Officer **Major General H. C. Ingles,** was delivered formally August 14 at the City Hall of Santa Monica, California, in the presence of city, state and federal officials. **C. F. Mason,** president of the California association, formally accepted it on behalf of the members.

Lon J. Jester, vice president and general manager of the Mid-West States Telephone Co., Rockford, Illinois, has announced that the modern fire-proof building to house the new dial equipment has been constructed in Cherry Valley, Ill., for the Milford Telephone Co., a subsidiary. Dial phones on farm and urban residences will begin about August 15, with work expected to be completed by October 1.

●

Paul Bame, manager of the Carbondale, Ill. exchange of the Illinois Commercial Telephone Co., has announced that construction has been completed on the new building and a switch-over to the latest equipment was made late in July. **J. H. Bennett** and **T. A. Grant** made the switch-over in approximately 90 seconds. No calls were in progress when the switch was made. **L. F. Shepherd,** general manager of Springfield, attended the switch-over.

●

Officials of the Pennsylvania Independent Telephone Association and Army officers attended ceremonies in the association's Harrisburg offices on July 25, when the Pennsylvania organization was given the Chief Signal Officers' Certificate of Appreciation. Shown attending the ceremonies are, front row, left to right: Lt. A. L. Kratz, Letterkenny Depot, Chambersburg; Harry R. Miller, Myerstown, director; Col. Howard S. Paddock, Signal Officer, Third Service Command, who made the presentation; C. E. Eaby, Ephrata, president of the association; J. K. Stolzfus, Birdsboro, director, and Lt. Theodore Toussaint, New Cumberland Army Reception Center. Rear row: Maj. Henry Anderson, Indiantown Gap; Maj. C. W. Brown, Middletown Air Service Command; Lt. Alta R. Joffe, of the WAC; Lt. Col. W. A. Morgan, commander, Harrisburg subdistrict, Third Service Command, and L. R. Thurston, acting executive secretary.

T. T. Clifford, manager of the Community Telephone Co. of Mohall, N. Dak., has announced to newspapers that a new $30,000 dial telephone exchange would be installed around the first part of October. The cable line for the new exchange was put in a year ago and priority was granted only a short time ago. The present system includes exchanges in Tolley, Maxbas, Westhope and Sherwood, N. Dak., with a total of approximately 900 stations. The new equipment is a 250-line board.

●

John A. Harbaugh of Sullivan, Ind., president of the Indiana Telephone Association, formally accepted on behalf of that association the Certificate of Appreciation at Indianapolis, July 28, at a luncheon in the Columbia Club. **R. V. Achatz** of Aurora, president of the Indiana Association during the formation of Signal Corps units, stated during the meeting that the industry will have jobs waiting for former employees when they return from service.

●

Earl W. Johns, for the past three years manager of the Highland district of the Illinois Commercial Telephone Co., has been promoted to plant superintendent of the northern district with headquarters in Kewanee. His new district includes 43 exchanges. **Corwin Dunn** is superintendent of the district.

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In 1940 the Army brought one of its toughest communications problems to Bell Telephone Laboratories and Western Electric.

A new radio was wanted for the Armored Forces—a multi-frequency set—in effect a *radio switchboard* to inter-connect tanks, scout cars, command cars, artillery units, anti-tank vehicles. It must withstand unholy pounding, deliver messages clearly through "boiler factory" din.

Normally, producing a model of such a complex set would take a year. In *three months* it was ready—an FM set operating on 80 crystal-controlled channels, any 10 selected instantly by push buttons. It was tested—accepted—ordered in quantity.

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Huge numbers of tank transmitters and receivers have been delivered by Western Electric and its subcontractors, Belmont, Delco, Farnsworth and Philco. Providing closer control through instant communications, this radio led to revolutionary changes in tank tactics—enabling Armored Forces to strike faster, more efficiently.

This contribution to the war is only one of many made by Western Electric—*the nation's largest producer of electronic and communications equipment.*

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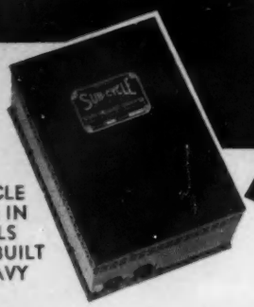

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THE LORAIN PRODUCTS CORPORATION
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W. J. Clapper, district manager of the United Telephone Co. at Wolcott, Ind., served as host at the open house in their new building July 21 and 22. The company has also rearranged all of the cable plant in the town. The new building is similar to the architecture of other buildings the company plans to build over the state. The Wolcott exchange serves approximately 400 stations. **Harry Dyer,** with the company for 35 years, holds the unique record of installing practically every telephone in use in that territory.

●

Commissioner Florence Kiely of the Michigan Public Service Commission, was invited by the Michigan Independent Telephone Association to attend its one-day session in Lansing last month. Your editor was busy with the TELEPHONE ENGINEER camera and her picture appears elsewhere in this issue.

●

John A. McDonald, 69, for almost 40 years owner of the LaHarpe (Kan.) Telephone Co., died recently at his home following a long illness. He operated the exchange until a year ago when it was sold.

●

W. P. Stokesberry has been made plant superintendent of the Associated Public Utilities Corp., Columbus, Ohio. He was formerly general superintendent of the Illinois Central Telephone Co., Clinton. His successor is **L. E. Claypoole,** formerly of the Peoples Telephone Co., Butler, Penn.

●

K. O. Shoots, former manager of the Gays (Ill.) Mutual Telephone Co., is the new manager of the Cawker City Telephone Co. at Cawker, Kans. **Mrs. Shoots,** a former operator of the Illinois Consolidated Telephone Co. office in Mattoon, Illinois, has joined **Mr. Shoots** and will assist him in the operation of the company.

●

W. Y. Cook has again become manager of the Salem, Mo. exchange of the United Telephone Co., succeeding his son, **Billy,** who has been inducted into the Navy. He has been associated with the local exchange and was manager of it for many years until his son took over the management.

●

Clyde S. Bailey of the USITA, Washington, D. C., in his letter to us announcing the resignation of **B. C. Burden,** the association's engineer, stated: "I regret exceeding to contemplate **Mr. Burden's** departure from the headquarters of our association. His work has been of a very high character and it would be our desire to have him remain if it were possible to prevail upon him to do so. In the more than a year and a half that he has been with us he has made a substantial contribution to the effectiveness of our association. He is a man of much ability and industry. We shall miss him greatly."

●

Miss Betty Gray of the Telephone Advertising Institute, 325 W. Madison St., Chicago, has notified directors of the United States Independent Telephone Association that the efforts of the Institute in signing up Independent telephone companies for advertising service were being successful. **Miss Gray** appeared at a number of state telephone conventions, presenting the Institute's plans.

●

A. D. Grote, general auditor of the Illinois Bell Telephone Co., has been elected president of the Chicago Control of the Controllers Institute of America, and **Harry C. Gretz,** assistant controller of the American Tel. and Tel. Co., has been elected president of the New York City Control of the national organization.

●

At a recent meeting of the Graybar Electric Co. Board of Directors, **George**

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LEADING TELEPHONE COMPANIES STANDARDIZE ON PENTA POLES

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Distributed by AUTOMATIC ELECTRIC SALES CORPORATION . . . . STROMBERG-CARLSON COMPANY

J. Cossman, Graybar central district manager in Chicago, was elected a director of the company. Also at the same meeting **E. W. Shepard,** treasurer of the company, was appointed a member of the executive committee.

R. E. Putnam, commercial manager of the Muskegon office of the Michigan Associated Telephone Co., succeeded **Norman E. Swanson,** commercial superintendent of the company's state-wide operations on July 1. **Mr. Swanson** has resigned and after a vacation will live in California.

●

W. W. Putney, Lincoln, president of the Midwest Life Insurance Co.; **Charles T. Stuart,** Lincoln, president of the Stuart Investment Co., and **Henry C. Woods,** Chicago, vice president of the Sahara Coal Co., were made directors at the board of directors meeting of the Lincoln (Neb.) Telephone and Telegraph Co. recently.

●

Thanks to **C. W. Higbee** and **Kemp Haythorne** of the U. S. Rubber Co., our visit to attend the luncheon at New York given by the company to announce their newly developed Nubun was a real pleasure. Technical details of the new product are given in another section of this issue.

●

Ray Palmer of Merrifield, Minnesota, has returned home, having completed his services with the U. S. Army Signal Corps in Alaska. He served also at Panama, but the two years just past were with the Alaska Communications Div. Several of his letters from Alaska have been reproduced in our Letters Column in recent issues.

●

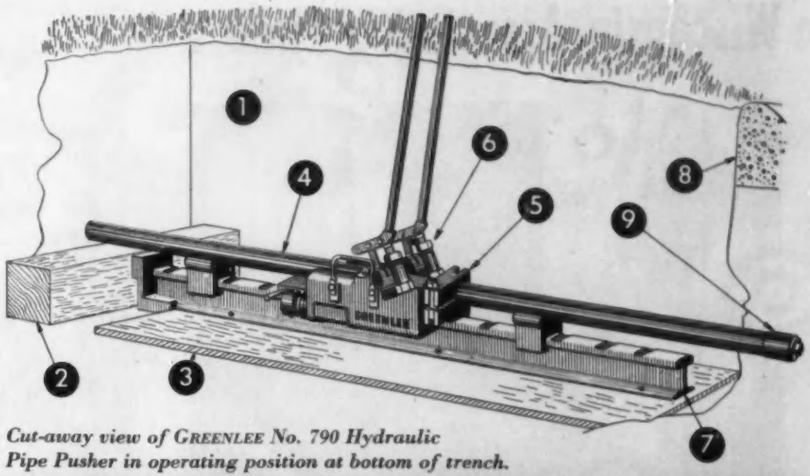
Walter S. Gifford, president of the American Telephone & Telegraph Company, celebrated his 40th anniversary with the Bell organization on July 5. He started with Western Electric at Chicago in 1904, with a salary of $10 per week.

●

Gustavus C. Crawford, for thirty-three years an electrical engineer with the Bell Telephone Laboratories in New York, died June 28 in his East Orange, N. J. home, after a year's illness. He was 68 years old and had been retired from his Bell Telephone Laboratories post for three years.

●

Warren H. Chase, Cleveland, building and equipment engineer for the Ohio Bell northwestern area, has been elected president of the N. C. Kingsbury Chapter, Telephone Pioneers of America.



Cut-away view of GREENLEE No. 790 Hydraulic Pipe Pusher in operating position at bottom of trench.

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1 A short trench is dug to accommodate the pusher and one section of the pipe to be pushed.

2 Blocking timber is placed in cross trench at back of pusher.

3 Pusher rests on 2" x 8" plank to which steel base is bolted.

4 Length of pipe to be pushed is placed in position on the two pipe supports.

5 Hinged pipe clamp is fastened to pipe by setting a single nut. Off-center, grooved bore of clamp provides leverage which will hold against maximum power. (No. 795 pushes pipe from end, without the use of pipe clamp.)

6 Hydraulic pressure in the power unit is developed by pumping the handles. Power unit has safety valve for releasing pressure in excess of capacity.

7 Hydraulic pressure moves the power unit forward on the notched steel base, against the pipe clamp, thus forcing pipe through the ground. When unit reaches end of base it is moved back to the starting position and pipe clamp is reset. (Pipe also can be pulled by reversing power unit on base and blocking opposite end.)

8 Pipe is pushed under paved street or other obstacle.

9 Pipe up to 6-inch usually is pushed closed, using reducers. Larger sizes are pushed open and soil is removed from pipe with a scoop and sewer rods.

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Wisconsin Association Cited

E. B. Samp, president, Wisconsin State Telephone Association receiving Certificates of Appreciation from Major Irving R. Quay.

Picture by Harry P'ke

On June 30, before 25 telephone representatives gathered in the Governor's office, Madison, Wisconsin, the Wisconsin State Telephone Association was presented with a Certificate of Appreciation awarded by Major General H. C. Ingles, Chief Signal Officer.

The presentation was made by Major Irving R. Quay assisted by Sr. Telephone Engineer, J. J. Koch, both from the Sixth Service Command, Chicago.

President E. B. Samp, in accepting the Certificate for the association, said in part, "All credit for this high honor is due the loyal Wisconsin telephone men who have gone so willingly into our armed forces and to their parents and families left behind. In full recognition of their patriotic sacrifices and on their behalf, I humbly accept this tribute of appreciation."

J. E. Byrne acted as chairman for the occasion and after the ceremonies were concluded in the Governor's office, those present were escorted by an official guide through the Capitol Building and thence to the Park Hotel where luncheon was served.

Plans for Experimental Radio Relay Station Submitted to FCC

For the purpose of relaying television programs and FM broadcasting and more important from the standpoint of the record communications industry, the handling of business radiotype, and facsimile traffic, the International Business Machines Corporation and the General Electric Company have just submitted to the FCC a program for the construction of a chain of experimental radio relay stations between Washington and New York City and Schenectady using Very-High Frequencies.

The project calls for the use of 6 bands of frequencies, ranging from 1,900 to 2,300 megacycles, and relay stations would be erected every 28 miles. The relay stations will be installed on high steel towers. The IBM-General Electric radio relay plan in general follows the same pattern as the New York to Boston radio relay system of the American Telephone and Telegraph Co. which is designed to handle television programs, telephone toll and teletype traffic. But the A. T. & T. program, to cost $2,000,000, which was approved by the FCC several weeks ago, aims to use higher portions of the spectrum for certain of its bands, ranging from 1900 megacycles to a top of 12,511,000 kilocycles.

The IBM application, which was filed with the FCC by Walter S. Lemmon, general Radiotype manager of the International Business Machines Corp., calls for the construction of terminal transmitter and receiver stations by that company at Washington and New York with the necessary relay stations between the two cities. General Electric's application was filed by Dr. W. R. G. Baker, vice president of the General Electric Co. who is also chairman of the Radio Technical Planning Board.

The bands or channels, sought by IBM and General Electric are: 1,900,000 to 1,960,000 kc; 1,960,000 to 2,020,000; 2,020,000 to 2,080,000; 2,120,000 to 2,180,000; 2,180,000 to 2,240,000; and 2,240,000 to 2,300,000. The type of antenna is to be highly directional narrow beam. Ffteen watts power was sought for the transmitting stations.

General Electric will manufacture and provide all the apparatus and equipment for the proposed stations. The applications stated that the proposed radio relay systems would be jointly owned and operated by IBM and GE.

Not only in television and FM broadcasting relaying is the proposed system most significant, but the application of the IBM, as stressed by Mr. Lemmon's letter to the FCC, projects the postwar handling of radiotype and facsimile traffic of industrial organization between Washington, New York and Schenectady as the initial link and then expansion of this service to other sections of the United States. In the case of the IBM-General Electric proposed system, the operation, if authorized by the FCC, will be, of course, on a purely experimental basis until its efficacy and functioning is fully tested and no commercial traffic, even the handling of television and FM broadcast programs, where rates are involved, will be allowed if the Commission follows the pattern laid down in the A. T. & T. approved project.

The IBM-General Electric project calls for the simultaneous relaying of two television programs plus a group of multiplexed business machines and facsimile circuits and the handling of FM broadcasting programs.

The initial research work will be carried out on the New York to Schenectady link, the joint application stated, with General Electric proposing the construction of new experimental stations or modification of existing stations—4 at New Scotland (Albany), two transmitting and receiving respectively; 2 at Schenectady and 2 additional at Round Top, near that city, using its television station WRGB as transmitter and receiver terminals and two present experimental television relay stations at Round Top. In the General Electric application for its portion of the proposed radio relay system, signed by Dr. Baker, it was cited that General Electic had accepted a contract to handle a postwar television broadcasting system with a pass-band of 9,750,000 cycles. (It was speculated that this television relaying might be for CBS.) The G E application noted that using FM, a 2 to 1 ratio between the maximum carrier deviation and the maximum modulation frequency is desirable. There would be a maximum frequency swing of 20,000 kilocycles, the application specified.

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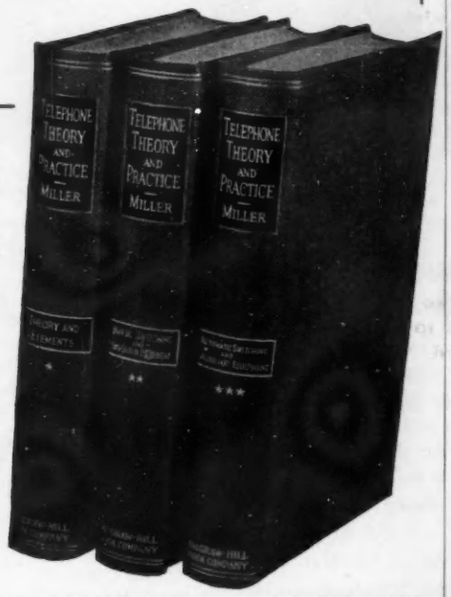

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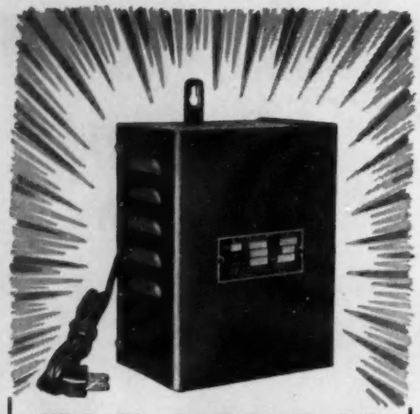

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Latin American delegation visits war communications plant-Donato Diaz-Medina (r.), Honduras banker, watches vital communications equipment take shape at the Stromberg-Carlson Co. plant in Rochester, N. Y. Pictured with him are (l. to r.): George Magalhaes, Inter-American Development Commission; Wesley M. Angle, Stromberg president; and Mrs. Anne Delcour.

Completes Purchase Of Minnesota Exchange

Since its organization 44 years ago, the Cannon Falls (Minn.) Telephone Company has been owned and operated by the Scofield family—with the exception of one member of the firm, H. M. Slocum, who was one of the organizers. Last January the company was sold to Ed. I. Miller of Kenyon and John Robertson of Cannon Falls who took possession July 1.

The company was organized as a partnership in 1900 with J. L. Scofield, Dr. C. L. Scofield of Banson, F. W. Scofield and H. M. Slocum making up the company. In 1912 Mr. Slocum sold his interest to the Scofields, and since the death of J. L. Scofield and Mrs. Scofield, his daughters, Mrs. A. J. Glover, and Mrs. R. M. Poe, have been included in the partnership. The company was incorporated in 1930.

Starting with 50 telephones the company has gradually grown and extended its lines in the surrounding community until at present there are about 750 telephones in its circuits.

Mr. Miller of the new firm has had 27 years of experience in the telephone business. He worked with the telephone companies at White Rock, Goodhue and Wanamingo and for the past 12 years has been manager of the Kenyon exchange. John Robertson has been with the Cannon Falls Telephone Company for the past seven years.

Washington, D. C.

One telephone installer, so the legend goes—or perhaps grows—achieved a degree of notoriety just by the simple process of falling asleep. He had worked about 40 hours at a stretch, putting in emergency service for the War Department in Washington, D. C. His last job was to attach wires to a connecting block under a desk. Exhaustion and a soft rug were too much, and he fell asleep, to be waked up a few hours later by a guard who was sure he was capturing a spy.

"If," his associates explained, "he'd picked any other desk in Washington to sleep under, it might have been different. But this was General Marshall's desk."

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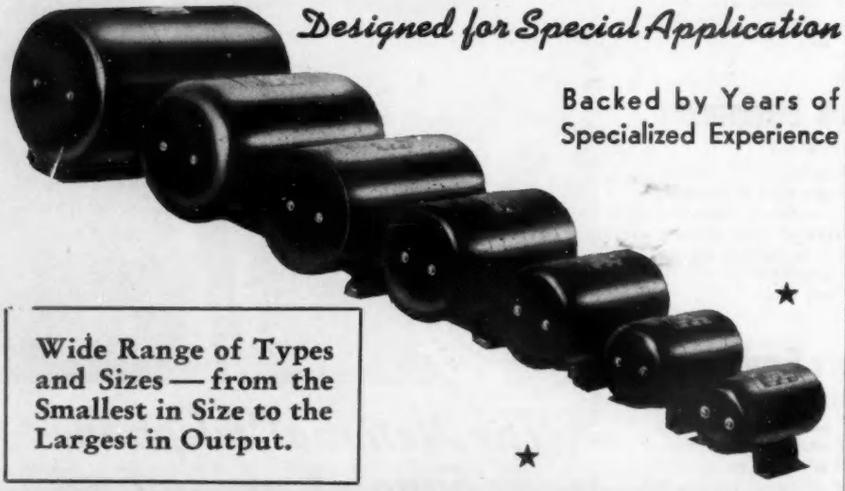

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Letters (Continued from page 11)

Recently, that is, in February of 1942, the need for telephone engineers being acute, I laid aside the gown of an investment dealer and donned the work clothes of a telephone engineer again, after 23 years. Serving with the 8th Service Command at Fort Sam Houston and Dallas, we helped the boys build telephone plants at camps, posts and stations. Outside of a few minor changes in cable gauges and sizes, also a few little improvements such as repeater stations and carrier systems, nothing much had been changed. People were still talking through telephones. Nevertheless, we were able to hold up our end of the business and in some instances show some of the younger engineers a few of the tricks we had up our sleeves. The emergency being considered at an end and the regulars being able to carry on, we have again turned in our tools and work clothes. It's a great business. Once it gets in the blood, there is nothing outside of a major operation that will let you be happy away from it. I suppose that's why so many of the old timers pass on soon after they are placed on the retired list.

I wish to pay a particular tribute to the telephone companies and the part they have played in providing our camps and posts with telephone service. The public perhaps does not realize that soon after the war began, Washington wondered how in the world all of the telephone service required at the new posts and camps was to be supplied. It was a question of man-power again but skilled man-power at that. Not everyone knows how to build a telephone plant. There were not enough men in our organization to do the job in the time required. It was a matter of days, not weeks or months, in most cases. To the credit of the traditions of the telephone industry let it be said, they came to bat and together they and we provided the service the Army needed and when it was needed. True, we had of little differences. If we had a load of 45 telephones to go into a cable, the telephone company boys suggested a 101 pair cable. To conserve critical material and because we do not apply commercial practices to Army service, we suggested a 51 pair cable. If the telephone company said they could provide telephone service in 60 days, we suggested that it be provided in 2 weeks. If we did not have the right kind of material available to do an emergency job, we got together and somehow provided service in time for the emergency. Both the Bell and the Independent groups were in the office constantly and when the emergency was on, these boys extended the full measure of their resources to us. Personally I am, proud to be one of the telephone men who have not forgotten the old traditions of getting the job done. The war effort would have been hampered considerably I feel sure if telephone men, as well as the workers in shops and factories, had not gone all out to achieve victorious effort.

I was surprised, agreeably, at the large number of telephone men I saw in the service as civilians. Many of the old timers were in there and many are still there, giving of their knowledge and experience. It is worthy of note that no Gestapo had to go out and bring these boys in when their service was needed. They came of their own accord and were glady accepted. If Hitler had a crowd of boys like that to depend upon, the war would be much harder to win. In fact, I don't see how you can down a real honest to goodness telephone man. It's the old American spirit. It's because we can find differences in the way we want to do things and fight about it if necessary and then get together and get the job done when the emergency arises that makes this old country of ours the best land in the world to live in. Thanks again for your letter. At another time in the near fuure I should like to discuss a matter that I consider important to the future welfare of the telephone industry and if your readers columns are still open, perhaps you will use the copy.

Yours truly,
O. B. Bohny

(Ed. Note: Mr. Bohny was with the Southwestern Bell Telephone Co. for 12 years, 1906 to 1918, did cable testing and laboratory work.)

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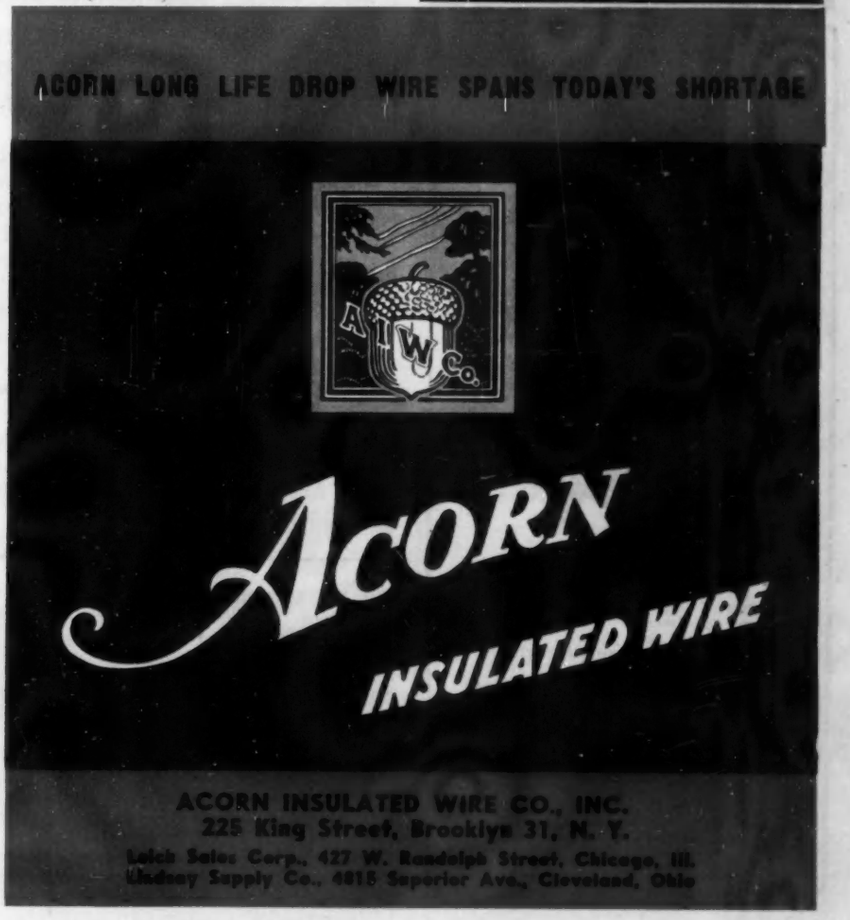
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Lincoln Company Shows Large Gain in Stations

Annual report of the Lincoln Telephone and Telegraph Company for the year 1943 shows that at the close of the year, the company operated 121 exchanges serving 70,406 telephones—a gain for the year of 3,942. These added stations were the result of 21,496 installations and 17,554 removals. A noteworthy factor in the total station gain was an increase of 983 rural stations. This farm telephone gain is larger than for the past several years.

The report discloses toll service revenues increased $285,765 over last year, marking the greatest gain and largest revnue from long-distance service in Company history. From all sources total revenues exceeded those of last year but the increase was largely absorbed by an increase in payrolls and higher taxes.

The overall payroll of $1,565,917 was 13% above the payroll for 1942 and that year the increase was 12% above the 1941 payroll, with little variation in number of employees for the three years.

Taxes for the year, the report shows, were more than $8.00 per telephone and over $500.00 per employee. They absorbed 17% of all revenues and 58% of net operating income.

At the year end, 110 employees were in military service.

Electrical Fundamentals For the Telephone Man

(Continued from page 29)

after the Bridge is balanced, the reading obtained on R must be divided by 2.

If, on the Simple Varley test, it is found that the Bridge balanced with zero resistance cut into the R arm, this indicates that the fault is at the same point as the strap and in such case the X arm would consist of the resistance of good wire and the R arm would consist of the resistance of the bad wire. (TO BE CONCLUDED)

EXAMINATION NO. 14
Alternating Current Instruments

1—In which of the three values of an A.C. wave are most A.C. instruments calibrated?
2—Explain the action of the soft iron vane type instrument.
3—Can D.C. instruments be used on A.C. circuits?
4—Explain the theory of the Thermo-Couple type movement. What is the frequency range of this instrument?
5—Explain the theory of the Copper-Oxide instrument and give its approximate frequency range.
6—What is an outstanding advantage of the Vacuum Tube voltmeter?
7—Is the tuned reed type frequency meter suitable for use on frequencies in the radio range?
8—Explain the theory of the resonant type frequency meter.
9—Describe the method whereby power in an audio circuit can be measured with an A.C. voltmeter of the proper type.
10—What is the power level in milliwatts across a loudspeaker whose impedance is 1000 ohms if the average voice voltage impressed across the speaker is 5.0 volts?

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1. Form fitting back and deep, saddle seat upholstered in genuine leather over curled hair pads.
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4. Solid maple frame with all joints glued and doweled.
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Manufactured by
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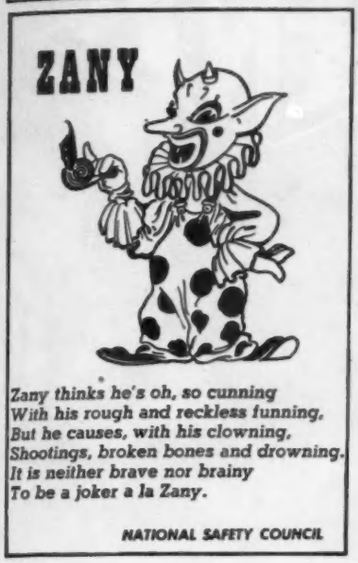
MEET THE AXEES
The Gremlins of Accidents



Zany thinks he's oh, so cunning
With his rough and reckless funning,
But he causes, with his clowning,
Shootings, broken bones and drowning.
It is neither brave nor brainy
To be a joker a la Zany.

NATIONAL SAFETY COUNCIL

Advisory Committee Meeting

The Telephone Operations Industry Advisory Committee recommended at its recent meeting that existing restrictions on installation of extensions, portable telephones and extension gongs be retained in Order U-2, which governs the use of telephone equipment, the War Production Board reported July 28.

This recommendation was made because available supplies of telephone equipment continue to be short, the committee said. Members called attention to the fact that emergency stocks of certain types of this equipment are being held by the Bell System. WPB explained that these stocks are for use in restoring service in emergencies. Committee members urged that some of this equipment be released and placed in immediate use. However, they agreed that toll equipment and certain exchange central office equipment should be kept in stock to guard against emergencies.

Available facilities for production of such exchange equipment should be used to manufacture items for "held" or "on hand" office orders, or for providing service to telephone subscribers who otherwise would be unable to obtain it, committee members said.

The committee unanimously agreed that the processing of appeals filed under Order U-2 should continue to be handled in Washington, rather than have such processing be decentralized to local WPB offices, ration boards, or to telephone companies.

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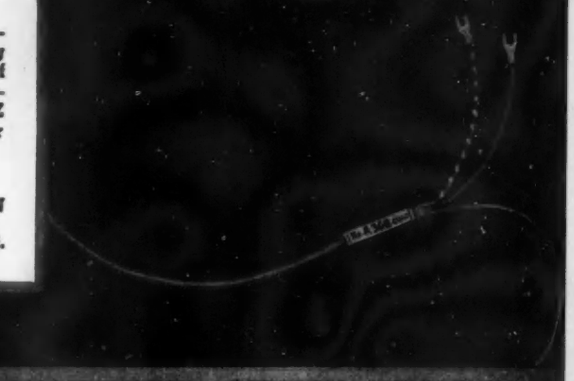

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Telephone Engineer

HANDBOOK TABLES

Subject: Moments of Resistance of Poles at Ground Line for Creosoted Southern Pine Poles.

File—Pole Line Design
Date—August 15, 1944

Ultimate Resisting Moments for Modulus of Rupture — **Classes Shown in American Standards Association Specifications**

Formula: M = 0.0002638 fC² = Moment in Pound-Feet; where f = Fiber Stress (Modulus of Rupture) c = Circumference of Pole 6' from Butt.

CLASS	1	2	3	4	5	6	7	8	9	10
Length of Pole (Feet)	CREOSOTED SOUTHERN PINE POLES (Fiber Stress—7400 lbs. per square inch)							No measurement 6 ft. from Butt required	No measurement 6 ft. from Butt required	No measurement 6 ft. from Butt required
16					19400	14475	11385			
18			36328	28708	22236	18079	13390			
20	61015	50115	40598	32368	25335	20786	15617			
22	70153	58156	47610	36328	28708	23751	18079			
25	80160	67012	52707	42853	34310	26986	20786			
30	102943	83697	67012	52707	42853	34310	26986			
35	124936	102943	83697	63967	52707	40598	32368			
40	144629	120309	98881	76726	61015	47610	38424			
45	166289	139524	111400	91078	70153	55387	45190			
50	189807	155207	124936	102943	80160	63967	50115			
55	208987	172023	139524	115798	91078	73390				
60	236767	190012	155207	124936	98881	80160				
65	258951	208987	172023	139524	111400					
70	282478	229665	190012	149856	120309					
75	307389	251410	202457	166289						
80	324784	266642	222706	177887						
85	352088	290626	236767							
90	371116	307389	251410							

The moments of resistance given in this table are based on minimum dimensions listed in the American Standards Association pole classification table for Southern Pine poles and an average fiber strength of 7400 lbs. per square inch. Since average circumferences of the poles are greater than the minimum required circumferences, the poles have a greater average strength than indicated in the tables.

Plant Engineering Agency Gets Recognition

The Plant Engineering Agency of the Army Communications Service, under command of Colonel Will V. Parker and located at Philadelphia, Pennsylvania, is relatively little known to the general public but among military men this branch of the Signal Corps is recognized for its ingenuity and its quick adaptability.

The Agency organization, maintained on a world-wide scale, is charged with the responsibility for installing and maintaining all fixed communications of the Army. It numbers but fourteen hundred officers and enlisted men, yet since last October it has made more than four hundred large-sized installations; and through an extremely ingenious device known as a "packaged carrier" it has enabled non-technical men, with only a rudimentary knowledge of communications work, to set up needed units under field conditions and use these ready-made installations with complete success.

A packaged carrier is a prefabricated "kit" of communications equipment so simple as to be almost foolproof, accompanied by printed instructions so clear and specific that any amateur can understand them. It enables soldiers, even under fire, to pile numerous messages, both by voice and by telegraph upon two open telephone wires and send them simultaneously. The messages are unscrambled at the receiving end. One set of wires is made to do the work of many. The more permanent installations are of wide variety and use, meterological stations and air base radio stations being especially numerous. To set up field radio stations the Agency crews have very often been in the direct line of fire. In beach invasions they generally carry portable equipment. Every conceivable obstacle must be met and overcome. For example, when small coral atolls selected for invasion have simply not had room for the necessary equipment, it has something been necessary to set up receiving and transmitting equipment on adjacent islands separated by open channels offering equal danger from shells and sharks.

In order to train men in the installation and maintenance of fixed equipment, the Plant Engineering Agency has organized a training camp near Philadephia which is called Plant Assembly Center. The training at this Center demands much of those who undertake it and not all of the ambitious applicants can measure up. It demands, above all, that innate knack of "knowing how," for the successful plant engineer is expected, quite as a matter of course, to do hard things easily. Their installations, erected at great personal risk, enable field headquarters in every theatre of war to enter into instant communication with the commanding general and with the War Department in Washington.

Retires

R. E. Phillips, district commercial superintendent, Alberta Government Telephones, at Lethbridge, Alta., Canada, has been retired on pension after some thirty years of service with the organization.

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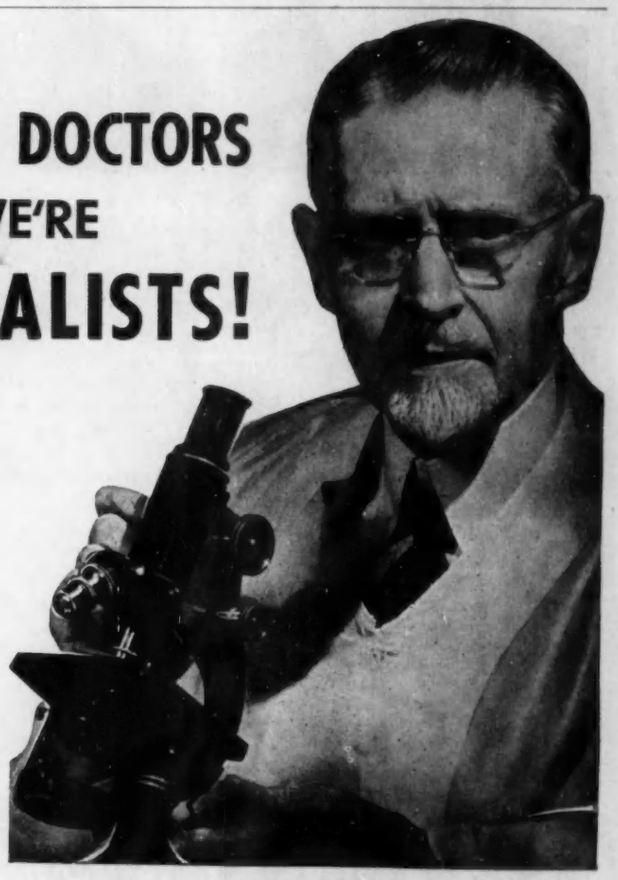

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R. C. Raasch

A. B. Leach

Copperweld Changes

The Copperweld Steel Company makes the following announcement through William W. Ege, general manager of sales:

Roy C. Raasch, formerly of the Chicago office, has been transferred to Cleveland, Ohio, where he will assume charge of that office, which is located at 1158 Union Commerce Building. He supplants E. N. Hazlett, who has left the company. Mr. Raasch has been associated with the Copperweld organization for the past eight years. Before that he was in the engineering department of the Public Service Company of Northern Illinois. He is a graduate of Iowa State College, Ames, where he received his degree in Electrical Engineering.

A. B. Leach will take over the assignments previously handled by Mr. Raasch in the Chicago office. He formery represented the Copperweld Steel Company in the St. Louis area. Mr. Leach is a native of the latter city, where he completed his high school training. He was given his technical education in the Electrical Engineering School at Purdue University, West Lafayette, Indiana. Prior to being affilitated with the Copperweld organization in 1938, he was associated with the Kansas Power Company at Dodge City, Kansas, and later with the G. L. Tarlton Construction Company at St. Louis, Mo.

Deported to Germany

To supplement an apparent shortage of skilled telephone, telegraph, and postal personnel in Germany, a recent draft of 3,000 employees of occupied Holland's state-controlled wire communications system was announced July 6.

This draft, reported by the underground newspaper, Vrij Nederland, followed hard on the heels of the German order suspending phone service throughout large areas of the Netherlands. The latter decree has been promulgated for the dual purpose of preventing the relay of underground information and keeping the lines clear for transmission of military commands.

Burgess Battery Company Receives Army-Navy "E" Award

For high achievement in the production of the materials of war, Burgess Battery Company, whose main plant is at Freeport, Illinois, has been awarded the Army-Navy "E."

Pictured right is Brig. Gen. Edgar L. Clewell, Commanding General, Western Signal Depots, who presented the "E" award flag; and left, Dr. C. F. Burgess, founder and chairman of the Burgess Battery Company, who re-

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LM
✓designed the way you want it
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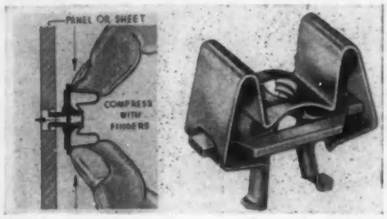
LINE MATERIAL COMPANY

ceived the award for the company in the ceremonies held on June 30 in Freeport. Burgess Battery Company is engaged in the manufacture of dry batteries for the Army and Navy.

New Speed Nut

No riveting, welding or spinning operations, nor any special tools are necessary to install this new self-locking Speed Nut in screw-receiving position for blind attachments. Merely compress the cage as shown in sketch and insert legs into clearance hole. The legs spring apart when pressure is released, the turned-up ends just clearing the back side of the panel. The nut will hold tight against the force of inserting the screw and the screw-tightening torque, and the floating Speed Nut within the cage allows for any misalignment of clearance holes.

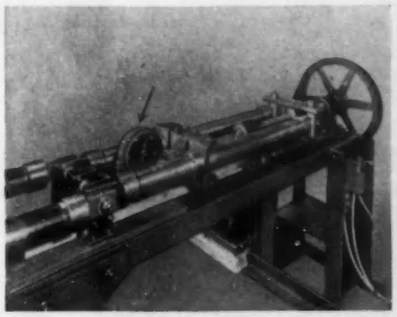


This Speed Nut has an extremely wide range of applications and can be made in larger screw sizes to meet any industrial requirement. Manufactured by Tinnerman Products, Inc., 2017 Fulton Road, Cleveland 13, Ohio. Please mention this magazine when requesting further information.

Many New Uses For Dynamometer Discovered

Traction Dynamometers, long known to engineers as dependable testing instruments, have found numerous new applications since the outbreak of the war. Due to their construction and method of operation, such units have found ready favor in laboratory and on the production line where conventional testing methods are not practical.

A leading manufacturer of aircraft equipment was recently called upon to make tensile tests on the supporting structure of pilot seats. Because of the odd size and shape of the units, a conventional tester could not handle the situation. The solution was found by mounting the seat to the floor and suspending a block and tackle from an overhead support. A Dynamometer was placed in series with the seat and block. As pressure was applied, the magnesium supports ultimately ruptured, giving the operator an accurate test in direct pounds load.



The Dynamometer can be suspended in any position, weighs only a few pounds, and is not injured by accidental overload. It has scores of uses in the laboratory as well as on the production line. Highly compact, it fits into virtually any mechanical setup and lends itself well to embodiment in new testing facilities. The instrument weighs only 8 pounds 4 ounces; measures just 8¼" x 6¼" x 3". Carrying Dynamometer design and accuracy to the ultimate, it has become a very real and powerful adjunct to the engineering and production field. Write to W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Illinois for additional information.

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Named By Philco

William E. Kress has been appointed sales manager of the Middle West for Philco Corporation, with headquarters in Chicago, it was announced recently by Thomas A. Kennally, vice president in charge of sales. Kress succeeds John M. Otter who was named sales manager for the Home Radio Division.

"E" Award For Fourth Time

The Army-Navy Production Award has been conferred for the fourth time on Bell Telephone Laboratories "for outstanding achievement in producing materials essential to the war effort," according to a letter from Robert P. Patterson, Under Secretary of War. Initial award was made in September, 1942.

Through a network of telephone, telegraph, cable and radio facilities, the Red Cross handles more than 20,000 messages a month for service men in the war zones and for their families at home, with about 2,000 of these concerning prisoners of war in Europe.

Directories

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NOTICE SERVICE MEN

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